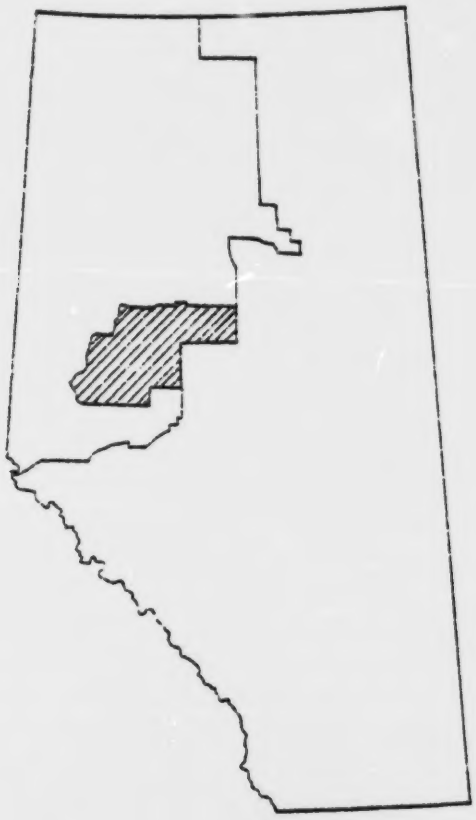
A STUDY OF
ECONOMIC GROWTH
IN THE
EAST PEACE SUB-REGION



Peace River Regional Planning Commission

March 1981

A STUDY OF ECONOMIC GROWTH

IN THE EAST PEACE SUB-REGION

Prepared for: Peace River Regional Planning Commission

in cooperation with

The Northern Alberta Development Council

Prepared by: Peter C. Nichols & Associates Ltd.
Economic Consultants
Edmonton, Alberta

March, 1981

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March 31, 1981

Mr. John Jarvie
Manager, Regional Planning
Peace River Regional Planning Commission
200 Windsor Court
9835 - 101 Avenue
Grande Prairie, Alberta T8V 0X6

Dear Mr. Jarvie:

We are pleased to submit to you our report entitled A Study of Economic Growth in the East Peace Sub-Region. The examination of social impacts in the study area is included in a companion report, A Study of Social Impact in the Lower Peace, North Peace, and East Peace Sub-Regions.

The main objective of the study is to forecast changes in economic activity and population in the sub-region over the next fifteen years. The report includes historical and base-line socio-economic data, industry forecasts, and from the latter, projections of employment and population. Recognizing that a number of factors may affect the growth of the East Peace area, the approach has been to make projections on the basis of alternative development scenarios. This will permit planners to "track" or to monitor actual growth within the forecast ranges and to make adjustments as new developments unfold.

We have enjoyed working on this project and trust that it will provide added guidance to the effective long-term planning of the East Peace sub-region.

Yours very truly,

Peter C. Nichols

PCN/cl

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This study was commissioned by the Peace River Regional Planning Commission and the study team gratefully acknowledges the on-going assistance and coordination provided by Commission staff and, in particular, by Mr. John Jarvie, Manager of Regional Planning.

A steering committee comprised of representatives of the various municipalities in the sub-region was formed and met regularly to guide the progress of the study and the authors appreciate the constructive comments and reviews made by committee members in respect of our interim reports and presentations.

The Northern Development Branch of Alberta Tourism and Small Business cooperated with the Planning Commission in carrying out this study while undertaking a similar project in the Lower Peace sub-region on behalf of the Northern Alberta Development Council. The consultants would like to thank its staff and particularly Mr. G. Archibald for their assistance in providing background information and reviewing the findings of the study at various stages.

Boykiw & Company, Economic Consultants, assisted in the analysis of the non-renewable resource sector and provided the comprehensive review and outlook of the oil and gas sector.

A great deal of information was gathered for this study and we express our gratitude to the many agencies and individuals who responded enthusiastically to our queries and requests for data and observations.

SUMMARY OF FINDINGS

1. The study involves an examination of the resource capabilities and economic structure of the East Peace sub-region and analyses the probable economic growth of the study area over the next 15 years. A separate but companion report reviews the social conditions in the study area and the implications of future growth in terms of facilities and service delivery.

2. The sub-region is bounded by the Smoky River on the west, on the east by the Peace River Regional Planning Commission area boundary as far south as the settled areas south of Valleyview, in the north by approximately the 21st Base Line, and in the south by the 17th Base Line. The sub-region encompasses roughly 3% of the total provincial area and 1% (about 19,000 people) of the Alberta population.

3. Between 1971 and 1976, the population of the sub-region declined marginally, by less than one per-cent. The urban centres combined showed only modest growth, with most communities remaining relatively stable in size. Net out-migration from the East Peace averaged about 320 persons annually between 1971 and 1976.

4. Because the population of the East Peace is markedly younger than the provincial average and has a higher fertility rate, the rate of natural increase should continue to be higher than the Alberta average for some time. Roughly 15% to 20% of the sub-regional population is of native origin. Educational and

income levels lag the Alberta averages, particularly in the rural areas.

5. Over the past two decades, the East Peace has experienced a continuing improvement in the range and level of physical infrastructure available to its residents. This trend has been generalized throughout the Province, of course but it has also been prompted by the on-going development and growth of northern Alberta. The central part of the sub-region, though not heavily populated, is relatively mature and generally supports a high standard of services. Nonetheless, the East Peace comprises significant areas that are sparsely settled, predominantly native and remote, particularly in the eastern regions. Infrastructure standards there lag behind many other parts of the Province.

6. The most pressing infrastructure concerns in the sub-region appear to relate to the smaller and more remote settlements, particularly in regard to water supply and sanitation, housing conditions, and inadequate road access.

7. The local availability of governmental and commercial services in the sub-region has grown, particularly in the past decade, in response to the growth of the economy of the East Peace generally and, in respect of senior government functions, to the pursued policy of administrative decentralization. Government activities have also expanded to meet the pressing social and economic conditions of the native population in the sub-region. The commercial sector is concentrated in the urban centres, with expansion occurring particularly in the communities of High Prairie,

Valleyview, and Falher. Growth has also occurred in the smaller incorporated centres and in a number of hamlets, but this has largely been confined to low-order services.

8. Until the twentieth century, hunting fishing, and trapping by native people constituted the major form of economic activity in the East Peace. During the first two decades of the 1900's, the lands in the sub-region, particularly in the northwestern areas, were opened for agricultural settlement and farming remains the most important sector in the sub-regional economy. The importance of the forestry and petroleum sectors dates primarily from the 1950's and 1960's. The oil industry is focused on the Valleyview area, while forestry is concentrated in the eastern parts of the sub-region. On-going consolidation in the agricultural sector has been offset by some increased activity in the forestry, service, and oil and gas sectors. Significant future development of the East Peace's economy will probably require an emphasis on the expansion of secondary and tertiary industry activities.

9. In 1976, the labour force participation rate for the East Peace was marginally above the provincial level, whereas in 1971 it had been slightly below. Employment levels are approximately the same as for the Province as a whole. Participation and employment rates are higher in the rural areas than in the urban centres.

10. An analysis of the basic industry sectors in the sub-region has concluded that:

- There will be little change in the fishing, hunting, and trapping sectors.

- Significant departures from historical agricultural development trends are not expected to occur. While there will be some increase in agricultural land use in peripheral areas of the sub-region, this will be more than offset by farm consolidation patterns. The number of farm units in the East Peace is estimated to decline by more than 200 in the next fifteen years.

- No significant changes in the East Peace forestry industry can be foreseen at this time. Much of the forestry area in the immediate region is presently committed and offers limited potential for new development. Under the "low" scenario, some decreases in activity and employment may result from wood supply problems and operational consolidation. Under the "probable" case, activity is expected to remain virtually stable, although increased logging north of Slave Lake may provide additional seasonal employment opportunities. Under the "high" case, a thermal-mechanical pulp mill might be built in the Utikuma area in the latter part of the study period. Under the "probable" case, industry employment is expected to increase only by about 5% over the fifteen year period.

- The East Peace accounts for less than 1% of provincial gas reserves and about 6% of remaining oil reserves. Oil industry activity in the sub-region will be largely dependent on the overall level of exploration and development in the

Province, which in turn will be influenced by a number of factors discussed in the report. However, further expansion of the oil industry is expected in the sub-region, particularly in the Valleyview area, and this could increase related employment by 70% over fifteen years. Notwithstanding this, the absolute number of new positions is likely to be modest in the context of the entire sub-region.

- To the extent that population and income levels rise in the sub-region over time, the retail and service industry will likely expand to accommodate the increased demands. The industry's development will be constrained by the limited potential for further resource expansion in the sub-region, and by the competition from high-order centres outside the study area.

- The tourism sector is relatively insignificant but of growing importance to the East Peace economy but its development will be constrained by the small number of tourist destination attractions and the limited user capability of available recreation resources. Nonetheless, the sub-region acts as a conduit for traffic on the Alaska Highway and, less importantly, for traffic to Peace River and the Mackenzie Highway. Such growth in tourist movements is likely to have an impact in terms of automotive, food, and accommodation expenditures and will assist in complementing the existing economic base and providing some limited form of diversification.

11. In 1980, employment in the East Peace totalled about 8,200 positions. Under the probable scenario, this will remain relatively unchanged to 1995. The decline in agricultural employment associated with continued farmland consolidation and rural out-migration will have a significant effect in terms of offsetting employment growth in other sectors.

12. Employment-based population projections prepared for the sub-region indicate that the population of the East Peace could:

- under the low case, decline by as much as 17% between 1980 and 1995.
- under the probable case, decline by about 10% by 1995.
- under the high case, increase by about 1.5% in the next 15 years.

Given the variations that may be inherent in the underlying assumptions, the consultants suggest that the probable and high scenarios encompass the most likely range of population projections for the East Peace.

13. The projected lack of population growth for the East Peace reflects in large part, the reduced potential for employment generation in the sub-region. It is also attributable to continued increases in labour force participation rates, especially for women, and to the rising proportion of the population in the working age groups resulting from changing fertility patterns.

14. Zero-migration population projections (ie. those having no in- or out-migration) prepared for the study exceed the employment-based projections, implying that net out-migration from the sub-region will occur over the study period. Under the probable development scenario, net out-migration would average about 350 persons per year.

15. The study has assessed the likely distribution of the sub-regional population. Under all scenarios the rural population will decline continuously throughout the study period. The urban population is expected to remain virtually unchanged during the next 15 years under the "probable" scenario, but could increase by 24% under the "high" scenario. Valleyview is projected to grow at a moderate rate while the other urban centres are expected to remain reasonably stable.

1. INTRODUCTION

1.1 BACKGROUND

This study was commissioned by the Peace River Regional Planning Commission (PRRPC) in April, 1980. The Commission is currently preparing a Regional Plan and, as part of the planning process, it requires an overall assessment of economic growth potential and expected development impacts in various parts of the Peace River region. The study follows an earlier investigation of the Grande Prairie area (Hollinshead Lefrancois & Associates, 1979) and is being undertaken concurrently with studies of the North Peace and Lower Peace areas. Reference can be made to Figure 1, which shows the location of the various sub-regional areas in the context of the Province.

The study has proceeded in cooperation with the Northern Development Branch of Alberta Tourism and Small Business which requires current regional economic data to assist the Northern Alberta Development Council and provide a reference source for the Alberta North in the 80's Conference held in late 1980.

1.2 OBJECTIVES

The overall objective of the study is to assess past, present, and future trends in the leading economic sectors of the study area and to determine the approximate magnitude, form, timing, distribution and related impacts of anticipated growth over the next fifteen years.

The main objective is to be realized through the following sub-objectives:

1. Review the historical development of the area in order to understand the changing characteristics of the economic base and of the population, and to determine how this might influence future development.

2. Analyze the population dynamics to indicate how these may influence future growth and the need for in-migration.

3. Analyze the physical resource base to determine current land use and capabilities, as well as the potential for further development.

4. Examine the current status and identify potential developments in the regional economy by sector in order to assess future growth and its implications.

5. Review the level of services and infrastructure currently available to serve the population and industries of the study area and examine the implications of anticipated sub-regional growth in terms of future service requirement.

6. Examine the major social impacts that might stem from the projected development of the sub-region and measures that might enhance the effects of change on the population.

7. Project future land use changes in the sub-region.

1.3 ORGANIZATION OF THE REPORT

The first sections of this report (Sections 2 through 4) include a description of the study area, a brief overview of its history and a description of its physical resource base. These are followed in Section 5 by an examination of the structure of the sub-region, as it pertains to the socio-demographic and settlement patterns of its population and the development of its services and infrastructure. Section 6 deals with the economic base of the sub-region; it begins with a discussion of current employment and income patterns and investigates at length the present status and, more particularly, the outlook for the major industry sectors over the study period. Based on the industry studies, projections of employment and, following this, population to 1995 are presented for the sub-region in Section 7. Included also in this part of the report are projections of the likely distribution of the sub-regional population among the urban centres and rural areas.

Appendix 9.1 includes a short background and economic base analysis of incorporated urban centres in the sub-region. The urban land use requirements associated with the economic and population projections given in the report are reviewed in Appendix 9.2.

The study team reported periodically to a steering committee comprising members from various urban and rural municipalities in the sub-region. These committee members have expressed certain concerns and reservations regarding the findings of the report and have discussed as well, courses of action that might be taken to monitor future economic development in the East Peace and to address the issues emanating from the report. These comments are reviewed in Appendix 9.3.

The final part of this report, Appendix 9.4, provides a bibliography of relevant source documents and a listing of the interviews carried out during the course of the study.

It is important to note that a separate, but companion report to this document has also been prepared, entitled "A Study of Social Impact in the Lower Peace, North Peace, and East Peace Sub-Regions". That report reviews briefly the social and service conditions that prevail in the relevant study areas and examines also the major social implications of the future economic development that is anticipated. Particular reference is addressed to service delivery in the following areas: education and training, social services, housing, health care, protective services, and recreation.

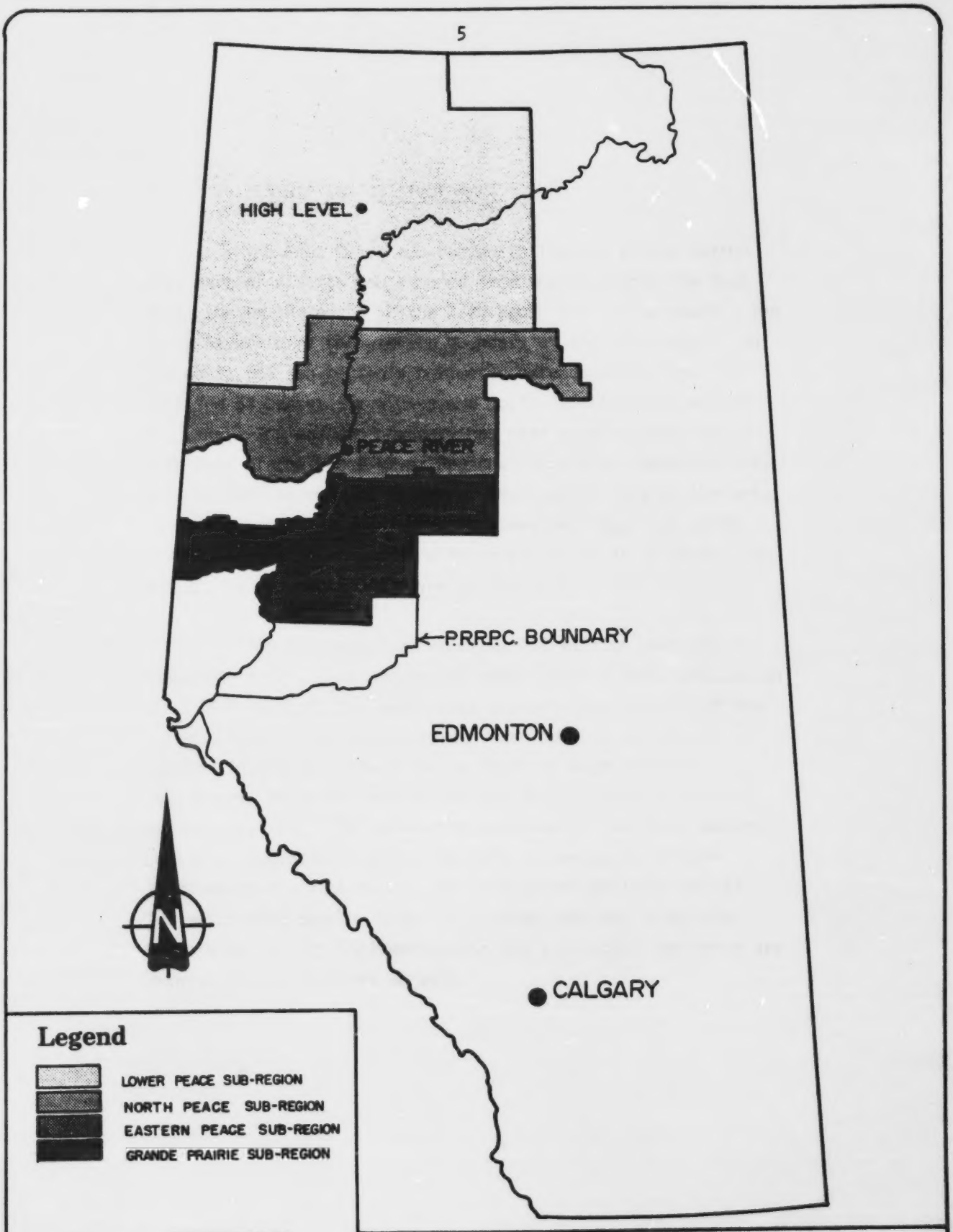
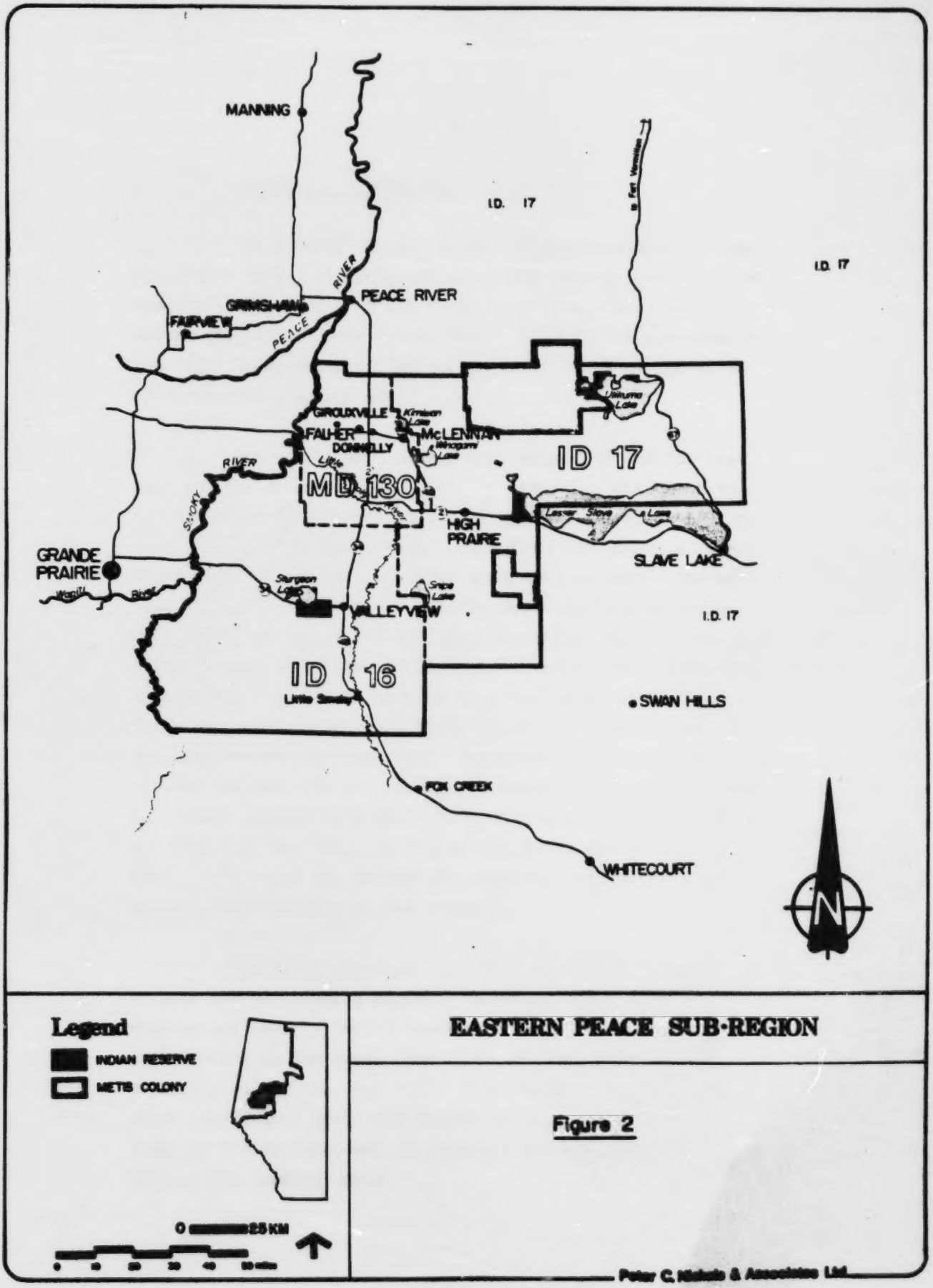


Figure 1: PEACE RIVER SUB-REGIONS

2. DESCRIPTION OF STUDY AREA

The East Peace sub-region is located in the north-west part of Alberta and extends from approximately the 21st Base Line in the north to the 17th Base Line in the south. The Smoky River forms the western boundary of the sub-region. On the east, the sub-region's perimeter extends south from the west end of Lesser Slave Lake and north from the east end of the Lake. The eastern boundary has been drawn coterminously with that of the Peace River Regional Planning Commission area but has been extended only as far south as to take in the settled areas south of the Town of Valleyview. Boundary lines have been drawn to coincide with census enumeration areas. A map of the sub-region is given in Figure 2.

The sub-region encompasses 1.8 million hectares or about 3% of the total provincial area. With a total population of 19,000 persons, the East Peace accounts for only 1% of the Alberta total. Six incorporated urban municipalities are located in the East Peace -- the Towns of High Prairie, Valleyview, McLennan, and Falher and the Villages of Donnelly and Girouxville. The sub-region encompasses one rural municipality -- Municipal District No. 130 -- and parts of both Improvement District No. 16 and Improvement District No. 17. Two Metis Settlements, known as Utikuma Lake No. 3 and East Prairie No. 4, are included within the sub-region and there are several Indian Reserves as well.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EASTERN PEACE SUB-REGION
Figure 2
Peter C. Nichols & Associates Ltd.

3. HISTORICAL PERSPECTIVE

The earliest people of this region maintained a nomadic way of life. Trapping (snaring) and hunting were the major means of subsistence. These first known inhabitants were Beaver and Sarcee Indians; the Beaver occupied the watershed of the Peace River while the Sarcee inhabited lands of the Athabasca and Smoky watersheds.

The development of the area began with the fur traders and explorers of the eighteenth century. Subsequent to Sir Alexander Mackenzie's ascent of the Peace River in 1792 to 1793, the fur trading companies enlarged their sphere of operations from the vicinity of Great Slave Lake in 1800. The main line of travel for nearly a hundred years was from Athabasca settlement, by way of the Athabasca and Lesser Slave Rivers and across Lesser Slave Lake to Grouard. Grouard, until 1914, was a large and busy centre serving as a port of entry for the large and undeveloped Peace River district. From Grouard, the settlers trekked by wagon train, horseback or foot to their various destinations in this area. A wagon trail had been cut to connect Grouard with Peace River Crossing. Later, a trail was also cut from Edson to Grande Prairie by way of Sturgeon Lake. This route was extensively used for a number of years prior to the building of the railway.

The first permanent settlers were established around or near the old trading posts. The Lesser Slave and Big Prairie settlements near Grouard were where the first lands were settled in the area. The first settlers did not farm extensively, for they had only a local market for their produce. Sufficient grain and vegetables were grown to supply the needs of the settlers and the trappers who made their headquarters at the trading posts.

Steel was laid into McLennan in 1915 and the major portion of the agricultural development in this area has taken place since that time. During the year preceding the arrival of the railway, the increase in settlement was spectacular. The open grassland country around High Prairie was soon taken, and small settlements were started around most of the stations along the railway. As the better areas have been taken up, the movement has been to areas with poorer access and necessitating heavier clearing of land. Today, the economy of the area is based mainly on gas and oil production, mixed farming, and lumbering.

4. PHYSICAL RESOURCE BASE

4.1 CLIMATE

4.1.1 General Observations

The climate of the East Peace sub-region is continental, characterized by short warm summers, cold winters and low precipitation. High Prairie is the only station in the area with weather records of significant duration. It has a January mean temperature of -17.2°C and a July mean of 16.0°C. The yearly precipitation at High Prairie averages 450 mm with 60% of this falling during the growing season. There are about 2100 accumulated growing degree days above base 5.6°C in the agricultural areas.[1] The frost-free period is about 90 days. Because of the continental climate, the yearly precipitation can be very irregular. Damaging drought may be expected in parts of the study area about one year in five and May and June are often drought-prone. In the East Peace, the variability of precipitation during the growing season is commonly plus or minus 25% to 30% of the expected thirty-year norm.

Differences in elevation, topographic characteristics, and geographic location may influence the climate which prevails in any location. Any lowering of temperature, due to increasing elevation or cold air drainage, may be significant in terms of climatic suitability for agriculture. The Canada Land Inventory's agricultural capability rating for agriculture is favourable for sites below 792 meters in elevation. Pending

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[1] An accumulated degree day is the number of degrees the mean daily temperature is above a specific datum over a yearly period. 5.6°C (42°F) is taken as the temperature for commencement of plant growth.

experimental support, it is assumed that areas whose elevation exceeds 792 meters in this area may have a climatic limitation for agriculture due to frost vulnerability. Areas whose elevations exceed 914 meters above sea level are not suitable for cereal crop production.

4.1.2 Planning Implications

Fluctuations from mean weather conditions are inherent in a continental climate and the effects of unpredictable rainfall patterns, frost or early snowfalls can be especially serious in this northerly agricultural district. The high incidence of drought in June tends to retard crop growth. This lack of moisture in combination with a relatively short frost-free period suggests that grain crops may have difficulty in reaching maturity in some years. This type of erratic climate encourages an emphasis on the production of coarse grains (barley and oats) and oilseeds (particularly rapeseed). However, forage crops for hay and seed production are also well suited to the climate.

In areas with elevations between 792 and 914 meters the frost potential is hazardous to crop production. In areas above 914 meters, frost damage may be severe enough to make it impractical to produce cereal crops. In terms of climatic suitability, there are sites in this study area that are potentially arable. However, climate is only one of a number of limiting factors to agricultural development and expansion. Topography, geographic location, surficial material and soil capabilities are additional variables that must be recognized as being interdependent with climate in determining agricultural feasibility.

The climate of the study area permits a number of outdoor recreational activities. In the winter there is cross-country skiing and snowmobiling. The summers permit camping, hiking, and many related outdoor activities. Climatic variables are also important in other aspects of land use planning. For example, temperature inversions need to be considered in site planning, especially if industry is to locate in the river valleys. As for other northern regions, the relatively severe climate also restricts the growth of plants and makes the feeding period for livestock long.

4.2 PHYSIOGRAPHY AND TOPOGRAPHY

4.2.1 General Observations

The study area consists of lowlands, and pre-glacial, high-plain remnants. It is characterized by rolling uplands, undulating river basins, and deeply entrenched river valleys. The main physical features are the end products of erosion and deposition during pre-glacial, glacial and post-glacial times. A low lying basin extends west from Lesser Slave Lake to follow the main drainage courses. The Lesser Slave Lowland and the Peace River Lowland of the Interior Plains Physiographic Region form this basin. At the east end the elevation of the basin is about 560 meters above sea level, whereas in the western part it is about 730 meters. Till plain remnants are found adjacent to the basin. Fine-grained deposits and level topography in the northeast have resulted in poor internal drainage conditions. Extensive wetland environments have developed in these depressions.

In the southwestern portion of the study area is the Wapiti Plain physiographic sub-region. It is characterized by long, gentle slopes which are interrupted by small undulations. Elevations in the south are about 1000 meters. Parts

of physiographic upland areas occur in the northeast and southeast corners of the study area. These are the Utikuma and Swan Hills Uplands divisions of the Interior Plains Physiographic Region. Their elevations are about 730 and 910 meters (2400 and 3000 ft), respectively. The Utikuma Upland is characterized by broken, rolling topography and ice disintegration features with many depressions, discontinuous small ridges, and plateaus.

The Smoky River valley is a major topographic feature of the study area. The valley ranges from 150 to 210 meters deep and its width is from less than one kilometer to nearly five kilometers across. Other major rivers of the area are the Little Smoky and Simonette Rivers. Lesser Slave Lake is formed in a fault-zone which also served as a glacial outwash channel. It is Alberta's second largest lake. Other large lakes include Utikuma, Ulinagarni, Snipe, and Sturgeon.

4.2.2 Planning Implications

There are two contrasting physiographic units in the study area, lowlands and uplands. The physiography and topography of the lowlands, and the long, gentle slopes leading away from the uplands, are generally suitable for agriculture where drainage and soils are not limiting factors. Recent demands for more agricultural land will eventually result in some poorly drained areas being cultivated. These new areas would need an adequate system of drainage to overcome the wet, cold soil limitations. Also, slumping along the river banks could be a problem where cultivation is conducted right up to the edge of the banks.

The colder climates of the upland areas limits the forestry and farming potential. These areas are better suited to recreational activities and wildlife habitat. Also, there

are many deep and large lakes in both the uplands and lowlands which provide opportunities for wildlife habitat and for human recreation.

Travel through much of the area is difficult owing to lack of roads, thick bush, and large expanses of muskeg; many of the muskeg areas are quite impassable, particularly in the wet season.

4.3 GEOLOGY

4.3.1 Bedrock Geology

4.3.1.1 General observations. The bedrock of the study area is made up of horizontally-bedded Cretaceous sandstones and shales. They are both marine and non-marine sedimentary deposits that gently dip towards the southwest. The oldest formation that outcrops is the St. John, a marine shale of Lower Cretaceous age. Its upper strata are exposed along the Smoky River valley. Overlying the St. John is the Dunvegan Formation, a series of alternating sandstone and shale beds of Upper Cretaceous age. Much of the Dunvegan was deposited in brackish water but some of the thick sandstone beds, which are associated with thin coal beds, were possibly of freshwater origin. Outcrops of Dunvegan in the study area are also confined to the Smoky River valley.

The Smoky River Group overlies the older Dunvegan Strata. The lower shale member of the Smoky River is a marine formation and is responsible for much of the slumping along the major rivers of the study area.

The uppermost bedrock formation in the area is the Wapiti, and it occurs at or near the surface throughout the southern half of the study area and caps the Utikuma Upland.

The Wapiti consists mainly of freshwater, thick-bedded sandstones, and shales. Coal seams are present in some horizons and small quantities of coal have been mined for local use.

The general topography prior to glaciation was the same as that today because of the insignificant amount of bedrock removed by glacial erosion. The large erosion remnants, such as the Swan Hills and Utikuma Uplands, stand high above the surrounding lowlands. Erosion of their bedrock, in pre-Wisconsin time, took place under arid to semi-arid conditions and resulted in broad piedments leading away from them.

4.3.1.2 Planning implications. Cretaceous bedrock exposures occur along the banks of the major rivers and their tributaries and form the escarpments of the upland areas. The bedrock of the Cretaceous strata are poorly consolidated, and consequently slumping is common on steep slopes. Thus, the erosion process could be accelerated where road allowances or seismic lines cut into these sandstones and shales.

In middle-Devonian times the Pacific Ocean flooded into northern Alberta across a low barrier in the Fort Nelson area. A large salt-pan was created as the ocean water evaporated from this Pacific embayment. Also, extensive coral reefs developed in these shallow tropical waters. In the porous salt and reef deposits were trapped the hydrocarbon reserves that now make up the gas and oil fields that have been discovered and developed in the area.

4.3.2 Surficial Geology

4.3.2.1 General observations. The entire study area was glaciated during the Wisconsin Ice Age. The glacier emanated from the area west of Hudson Bay. It receded by stagnation, rather than by frontal retreat. Thus, the first stage of

deglaciation was marked by a general lowering of the ice surface until the pre-glacial uplands were exposed. This resulted in a thin mantle of dead-ice moraine on the Utikuma and Swan Hills Uplands. As the melting progressed, ground moraine and hummocky dead-ice moraine were deposited over the higher reaches of the lowland areas. Continued melting produced large quantities of water that ponded in front of the receding glacier to form proglacial lakes. These lakes covered most of the lowlands and in them were deposited sediments. These lakes were adjacent to the ice and so floating icebergs were common; upon their melting a considerable load of glacial debris was dropped into the lakes.

Where the lake deposits are thin the topography is that of the underlying ground moraine, and not the featureless plain that characterizes areas covered by thick glacier-lake sediments. Superimposed on the post-glacial landscape is the present-day drainage system. It was established soon after the glaciers disappeared and generally followed the pre-glacial lowlands and the depressions created by glaciers.

Most of the surficial deposits of the study area are the result of the last glacial stage. They include glacial till, glacial outwash, and lake deposits. Wind and water have been laying down new deposits and reworking old deposits since glacial times. Also, present-day modifications of the landscape are being accomplished by the infilling of depressions and lakes by organic materials. The results of this can be seen in the extensive muskegs and bogs which cover large tracts of the area.

Recent alluvial deposits are common within the floodplains of the Little Smoky, Goose, Iosegun, and Simonette Rivers. These deposits have variable textures depending on

their positions within the floodplain. Significant areas are poorly drained, with floodplains subject to periodic inundation.

4.3.2.2 Planning implications. The surface deposits of this area consist of glacial till, glacio-lake, lake, running-water transported and wind transported sediments. Till deposits are composed of medium to fine textured materials deposited through ice action. Glacio-lake sediments are made up of fine textured materials deposited in pro-glacial lakes, usually on the gently sloping land. Lake deposits are fine to very fine and are usually stone-free. They occur extensively in the flatlands adjacent to the Peace River. Water transported sediments are composed of coarse to medium textured materials which have been transported by moving water. They occur as outwash, river terraces and on recent riverflats. They are excellent areas for obtaining sand and gravel and can also be excellent groundwater sources. Wind deposited sediments consist of coarse to medium textured materials that occur as dunes and often have high recreation potential.

4.4 SOILS

4.4.1 General Observations

As a result of climate, vegetation, topography, and time, the original rock or parent material have been changed physically, chemically, and biologically, to become soil. The soils of this study area that have agricultural significance have developed under the influence of a forest cover. These soil groups are: Dark Grey, Dark Grey Wooded, and Grey Wooded soils.

The Dark Grey and Dark Grey Wooded soils are found along the Smoky River and in the Lesser Slave Lake physiographic sub-region. Leaching, the downward movement of soil

nutrients carried by water, has resulted in the loss of some essential nutrients, but these soils are the most productive in the study area.

Grey Wooded soils are the most common in the study area. They are found throughout the region except in the Lesser Slave Lake lowlands. Where they occur, frost is a hazard to agriculture. These soils are low in natural fertility but they respond to the application of mineral fertilizers and additions of organic matter. Coarse grains and hays are the principal crops grown on these soils. Careful management is required to achieve good productivity.

In the East Peace sub-region solonetzic soils occur in association with the Dark Grey, Dark Grey Wooded and Grey Wooded soils and are found primarily in the west-central region of the study area. They are characterized by a hard to very hard structured subsurface horizon. This causes the surface horizon to erode unevenly which results in "pockmarked" microrelief. Their productivity is generally lower than the adjacent soils.

Fine-grained deposits and level topography have resulted in poor drainage conditions such that extensive wetland environments have developed. Through time, organic soils have formed in these wetlands. They occupy more than 50% of the total land area in the southwest and northeast corners of the study area, usually in association with Grey Wooded soils. On the surface they have at least 30 centimeters of peat which is derived from sphagnum moss. These soils are acid to moderately acid and have a high water holding capacity. Their productivities and capabilities are relatively low.

4.4.2 Planning Implications

The proper utilization of soils in the sub-region involves the choice of crops that are well suited to the area, and the management of these crops for optimum economic production. Fertilizers should be used as part of management, not in place of it. Economical crop production depends on the conservation and efficient use of soil moisture. Tillage practices should be used to minimize moisture losses from run-off and evaporation caused by wind. It should be recognized that with the continuing improvements in farm management practices, the introduction of new varieties of farm crops, and the increased use of commercial fertilizers, the productivity capabilities of the soils will undoubtedly rise and a shift in the present limits for productivity may occur.

The erodibility of much of northwestern Alberta's soils is largely due to the nature of these materials; they are easily transported by water and wind. Gulleying of agricultural lands, and land slides along the river banks and other steep slopes illustrate the erosion tendency. When the native vegetation is removed for agricultural expansion or forest harvesting, these processes are greatly accelerated.

4.5 WATER RESOURCES

4.5.1 Surface Water

4.5.1.1 General observations. When the Wisconsin Glacier retreated from this region, it deposited morainic debris over the entire area. This caused widespread interruption of the pre-glacial drainage systems and resulted in an intricate pattern of lakes of all sizes, lowlands with impeded drainage, and a glacial plain. The study area has subsequently been dissected by numerous rivers and streams.

There are two major drainage basins in the East Peace sub-region. The Smoky River Basin drains the western side of the study area into the Peace River and the Athabasca River Basin drains the eastern area into Lesser Slave Lake. The largest streams include the Smoky, Little Smoky, and Simonette Rivers. The hydrologic regimes of these rivers indicate continuous flow throughout the year. Periods of highest flow are during late spring and early summer. Both winter freeze-up and spring break-up occur on the small streams before they do on the larger ones.

The water quality of the lakes in the region is variable, being dependent upon the physical qualities of the lakes. The shallow lakes, such as Winagami, generally have soft shorelines and basin bottoms, weed-choked shorelines and poorly drained backshores. This limits their capabilities for intensive lake-oriented activities but it does provide excellent water fowl habitat. The lakes found in the uplands and Lesser Slave Lake are characterized by clean water, gradual offshore slopes, well-drained backshores and wide, fine-sand shorelands that extend far into the water.

4.5.1.2 Planning implications. To date, the natural water quality of the East Peace sub-region has been relatively acceptable. There has not been any significant changes in river water quality due to industrial, agricultural, or municipal development. However, the present water quality should be maintained to sustain wildlife species and ensure their successful reproduction and migration patterns. Continual monitoring of water quality will be necessary if large-scale industrial use, population growth, and more intensive agriculture practices occur.

Agricultural activities should not be conducted in areas immediately adjacent to water bodies. Along rivers and lake shores there are a number of potential effects of cropping to the shoreline: slumping and erosion would be more prevalent and leaching of herbicides, pesticides and fertilizers, and contact of pesticides, may reduce water quality. The erosion of land and the movement of water are synonymous. The activities of man which result in the removal of natural vegetation, disturbance of surface and subsurface soils, and modifications of water courses, may compound the effect and rate of erosion. The problems which might develop when land use and water management are not integrated may be long-lasting and ultimately difficult to solve. For example, continued erosion can lead to increased siltation resulting in the destruction of waterfowl habitat, fish habitat, and a general degradation of the environmental and visual qualities of the waterbody.

Recreation and commercial fishing appear to be the most important human demand placed on the regional lake resource at the present time. The smaller lakes do not lend themselves to industrial use in most cases. The poor physical characteristics of these lakes indicate that they are capable of accommodating only certain activities and can sustain a very limited number of users.

4.5.2 Groundwater

4.5.2.1 General observations. For the purpose of reviewing groundwater supplies, the study area may be divided into north and south sections along the southern margin of the Lesser Slave Lake and Peace River Lowlands physiographic divisions. The north half is underlain by shales, and the south half predominantly by sandstones. In the south half, where the sandstone bedrock or its contained coal seams constitute the aquifers, the thickness of the overlying Pleistocene deposits

is the chief problem to be considered in obtaining water. In the north half, where the bedrock is composed of shale, the usual underground water supply is from the occasional pervious lense of the Pleistocene beds. Often, these lenses yield very hard water in small quantities; deep wells yield water having a high percentage of dissolved solids from bedrock aquifers.

The highest yield and best quality of groundwater can be expected from surficial sands and gravels. However, the positions of these deposits are not well known. A few shallow wells in the northwestern corner of the study area and the thin gravelly deposits on the northeastern upland have yielded good supplies of potable water, but these sites are among more sparsely settled areas. Towns in the northern parts of the area, such as Falher, Donnelly, and Girouxville, experience the greatest difficulty in getting enough potable water. The Wapiti Formation sandstones are the best bedrock sources of water in the study area. Bore-holes underlain by these beds are reasonably certain to obtain a supply of good water at relatively shallow depths.

4.5.2.2 Planning implications. Throughout the East Peace sub-region groundwater availability is variable. With the increase in water consumption and growth of communities in the Peace River district, the value of adequate supplies of good quality water must be recognized. The locations of pre-glacial buried river valleys are not well established, especially in the non-populated regions of the study area and consequently, the locations of these high-yielding aquifers are not well known. Any significant expansion of residential or industrial water requirements could place severe pressures on available groundwater supplies and would require further evaluations of groundwater availability. Supplies of 100 to 450 litres per minute (lpm) would appear to be the lowest supply quantity that could be tolerated by substantially sized industries. For

country residential expansion, groundwater supply quantities of five to 25 lpm are the lowest acceptable amount.

The groundwater recharge areas are crucial to the future use of groundwater resources. The upland sites are the major areas of recharge and must be protected. Also, changes in land use, such as deforestation, and sand and gravel extraction should be carefully planned to ensure that groundwater quality and quantity is not reduced.

4.6 VEGETATION

4.6.1 General Observations

The East Peace sub-region is within the Boreal Forest region. It is distinguished by a conifer-deciduous tree cover, interspersed with grasslands and marshes. Climate is the single most important factor controlling the vegetation. A limited number of tree species are adapted to the cold winters and brief growing seasons which characterize this zone. Fire has been a significant factor in the vegetation composition and much of the native vegetation has been destroyed by repeated fires. The mosaic of vegetation found at any site is also dependent on soils, slope, aspect, and drainage. The most widely occurring tree species include trembling aspen, balsam poplar, white and black spruce, jack and lodgepole pine, tamarack, and birch. Common to the understory of the forest are: wild rose, raspberry, chokecherry, buffalo berry, native grasses, horsetails, and mosses. Wet depressional sites are covered with vetches, sedges, and sphagnum moss.

Rowe (J.S. Rowe 1972) has identified three sections of the Boreal Forest region which occur in this study area. The Aspen Grove section is found in two areas: the western portion of Lesser Slave Lake and near Sturgeon Lake. Trembling

aspen is the only tree species abundant in natural stands. Interspersed with the aspen bluffs are prairie and meadow patches.

The Lower Foothills section is found in the southeast corner of the study area in the Swan Hills Upland. It is a transitional forest between the Boreal and Subalpine Forest regions and is above elevations of 850 meters in the study area. As a result of the cold climate here, the growth of commercial forest is not as good as areas with lower elevations.

The third forest association, the Mixedwood section, is found throughout the remainder of the study area. This forest section has an abundance of conifers that are broken up by patches of grassland and aspen groves.

4.6.2 Planning Implications

Man's effect in this area has been substantial and will likely increase in the future. His presence as a cultivator and forester reduces the occurrence of major forest fires. An increasing amount of the Mixedwood and Aspen Grove sections have been replaced by cultivated forms of vegetation. The soil deposits, when well covered with native vegetation, are quite stable and are not usually susceptible to water or wind erosion. However, the removal of the vegetation is often quickly followed by erosion which may be detrimental to water quality. Also, grazing pressure may weaken the grasses and open areas suitable for aspen colonization or it may damage the trees to the extent that vegetative regeneration will cease.

The Mixedwood section of the Boreal forest region is the largest and commercially most important forest zone in the Province. But, because of the cold climate and short growing season, the growth of the forest here is slow. The capability

classification of the Mixedwood section is based on a sawlog economy with a 100-year rotation. Stands of merchantable timber occur on the well-drained, lowland sites. However, these same sites are in competition with agricultural demands for increased arable lands.

The Boreal forest has great value for the success of wildlife, providing them with food and cover. The natural vegetation is also aesthetically attractive for country residential development or recreation oriented activities.

4.7 FISH AND WILDLIFE

4.7.1 General Observations

Moose are the most abundant big-game animals in the region. They are usually found near or in river valleys. Other ungulates, in order of abundance, include: mule deer, white-tailed deer, elk and woodland caribou. Mule deer have decreased and white-tailed deer have increased in numbers since settlement of the area. Elk are found in limited numbers and have not regained their pre-settlement populations. Woodland caribou are occasionally seen in the Utikuma upland region of the study area. Black bear and wolf are present but they generally keep away from the settled areas. Grizzly bear are occasionally hunted in the southernmost portions of the study area. Limitations to the large mammals are: the severe climate, poor soil fertility, inadequate interspersion of landforms, flat topography, and excessive moisture. Beaver, snowshoe hare, muskrat, marten, fisher, weasel, mink, and wolverine are found throughout the region.

The most abundant waterfowl are mallard, pintail, shoveler, lesser scaup, bufflehead and redhead. The shallow lakes in the northern region of the study area and the west-end

of Sturgeon Lake are particularly good waterfowl habitat. Utikuma Lake provides the main fall staging area and migration stop in the region. The shallow lakes that have a good fringe of emergent cattail, bulrush and sedge provide both protective and nesting cover. Lesser Slave Lake has a limited capability for waterfowl production because of deep, open water, and a lack of emergent shoreline vegetation.

The total number of waterfowl using the lakes of the study area varies from year to year, depending upon water conditions of the prairies. During periods of drought on the southern prairies many more ducks use these northern lakes.

A variety of shorebirds also nest in the study area. Upland birds frequenting northwestern Alberta include spruce, ruffed and sharp-tailed grouse and ring-necked pheasant.

The native sport fish are basically warm-water species such as northern pike, yellow perch, walleye, lake whitefish, and Arctic grayling. Many species of suckers and minnows also inhabit the region. Cold-water fish, such as trout, require gravel or sand lake bottoms for spawning; since this habitat is restricted in the region, these species are virtually absent.

4.7.2 Planning Implications

The influx of settlement into this region has generally reduced the ranges of indigenous large mammals. However, wildlife management surveys indicate that the wildlife resource in this region has been under-utilized in the past. Some areas, being sparsely settled and having poor accessibility, could provide a greater degree of trapping and hunting income to the livelihood of the region. At the present time, beaver

and muskrat provide the highest numbers of pelts and predominate the list of animals trapped in this region.

The conservation of fish and wildlife habitat, by proper land-use planning, is vital to the production of both commercial and recreational fish and wildlife resources. Fishing does not contribute significantly to the overall economy although locally it is important. Lesser Slave Lake and Sturgeon Lake provide the greatest fish catches in the study area. The greatest portion of the catch is northern pike, walleye and lake whitefish.

The shallow, productive lakes are generally unsuitable for water-oriented recreation activities, but they provide excellent habitat for waterfowl. The forests and grasslands are used extensively by the big-game mammals. The clearing of land for agriculture and the retardation of forest fires will have repercussions on the populations of big-game and small mammals.

4.8 MINERALS AND OTHER NATURAL RESOURCES

The sub-region is known to contain various minerals and other natural resources which have present or potential implications to its economic development.

4.8.1 Oil and Natural Gas

Oil and natural gas have been discovered in the study area and have had some considerable effect on regional development, particularly in the northeastern and southwestern parts of the region. The geological characteristics and exploratory activity of the area suggest that additional development may occur in the future. The outlook for the oil and gas industry,

including a review of its historical growth, is discussed in detail in a later section of the report (Section 6.5.6).

4.8.2 Coal

The Upper Cretaceous (Wapiti formation) contains some of Alberta's plains coal reserves and is present in much of the region. However, no commercially significant coal deposits have been encountered and the prospects for coal development to occur in the East Peace is considered to be remote at this time.

4.8.3 Sand and Gravel

Commercial sand and gravel deposits exist in the sub-region, particularly in river valley areas and are available to meet the construction needs of the area. The development of these deposits generally has only nominal significance in terms of its direct employment impact.

5. REGIONAL STRUCTURE

5.1 LAND DISPOSITION

The East Peace sub-region comprises some 2.4 million hectares. Forest lands or 'green' areas not presently available for agricultural development or settlement account for one half of the total area of the sub-region. Land available for settlement account for another 41% of the sub-region, of which an estimated 85% is currently settled. Metis settlements and Indian reserves comprise an additional 9% of the area.

5.2 POPULATION AND SETTLEMENT PATTERNS

5.2.1 Population

The East Peace sub-region accounts for only 1% of Alberta's population; according to the most recent Canada Census data, the population of the region totalled 18376 persons in 1976 but it is currently estimated to be approximately 19000.

Approximately one-third of the East Peace population is urbanized while the remainder lives in rural areas or in small, unincorporated communities. By comparison, more than three-quarters of the provincial population resides in urban centres.

The most reliable historical population figures for the East Peace sub-region can be derived from the 1971 and 1976 Canada Census tabulations, shown in Table 1. During that five-year period the population declined marginally, by less than 1%. Of the rural municipalities, I.D. 16 and 17 increased in population while M.D. 130 showed a decline. The urban centres combined showed only a modest growth, with most communities

Table 1. Population of the East Peace sub-region, 1971, 1976, and 1980.

	1971	1976	1980 (estimated)
INCORPORATED CENTRES			
High Prairie	2354	2281	2414[a]
Valleyview	1708	1716	2066[a]
McLennan	1090	1133	1212[b]
Falher	918	1120	1170[c]
Girouxville	347	303	315[b]
Donnelly	274	278	360[c]
Sub-Total	6691	6831	7537
RURAL AREAS			
I.D. 17 (portion)	4209	4279	4335[d]
I.D. 16 (portion)	4077	4318	4520[d]
M.D. 130	3409	2948	2625[d]
Sub-Total	11695	11545	11480
TOTAL	18386	18376	19017

a 1980 municipal census.
b Department of Municipal Affairs figures for 1979.
c Extrapolated from 1979 municipal census figures.
d Extrapolated on basis of 1971 to 1976 trend.

Source: Statistics Canada. Census of Canada, 1971 and 1976. Estimates for 1980 by Peter C. Nichols & Associates Ltd.

remaining relatively stable in size. The net out-migration from the sub-region averaged about 320 persons annually between 1971 and 1976.

The study area population has remained relatively stable since 1976, with modest growth occurring in some of the urban centres partially offset by continued rural out-migration. Based on the most recent municipal census data available and extrapolations of past trends, the present 1980 population is estimated to be only 3 1/2% higher than the 1976 level; these estimates are shown in Table 1.

5.2.2 Urban Settlements

The largest urban settlements in the sub-region include High Prairie, Valleyview, McLennan, Falher, Girouxville and Donnelly. Together these communities account for 40% of the sub-regional population.

The largest community in the East Peace is the Town of High Prairie. Located near the west-end of Lesser Slave Lake, the town is served by Highway 2 and the Northern Alberta Railway (NAR), and has a paved, lighted airstrip. The town supports several lumber mill operations and serves as a regional agricultural support centre. The town has increased slightly in size over the past decade, from a population of 2354 in 1971 to 2414 persons at present.

Near the southern boundary of the study region is the Town of Valleyview. The town lacks rail service but has a paved, lighted airstrip, and is located at the intersection of Highways 34 and 43. The town is an important service and accommodation centre for through traffic to the Alaska and Mackenzie Highways; it also provides a service function to the oil and gas industry nearby. The town's population declined

somewhat during the 1966 to 1976 period, but has increased by 20% over the past four years.

Some 80 kilometers to the north of Valleyview is the Town of McLennan. The town is served by Highway 49 and the NAR, and has nearby access to a regional paved and lighted airstrip. The town serves as a local agricultural service centre and has increased slightly in population over the past several years, from 1104 in 1966 to 1212 in 1980.

Centred in a prosperous and largely French farming region -- midway between Peace River and Valleyview -- is the Town of Falher. Located on Highway 49 and four kilometers west Highway 2, the town is served by rail and shares access to a regional airstrip with other nearby communities. Falher functions as a regional agricultural service centre in addition to supporting several industry-related processing plants. The increase in the community's prosperity is reflected in an unspectacular yet consistent growth in population, which has increased from 843 in 1966 to an estimated 1170 in 1980.

A mature agricultural community located just north of Highway 49 west of Falher, the Village of Girouxville has maintained a relatively constant population of about 300 persons since 1966.

The Village of Donnelly is situated near the junction of Highways 2 and 49 and acts as a farm service centre. Historical Canada Census data showed the community's size to be relatively unchanged, but the most recent municipal census suggests that the local population has indeed grown over the past few years and is now approaching 400 persons.

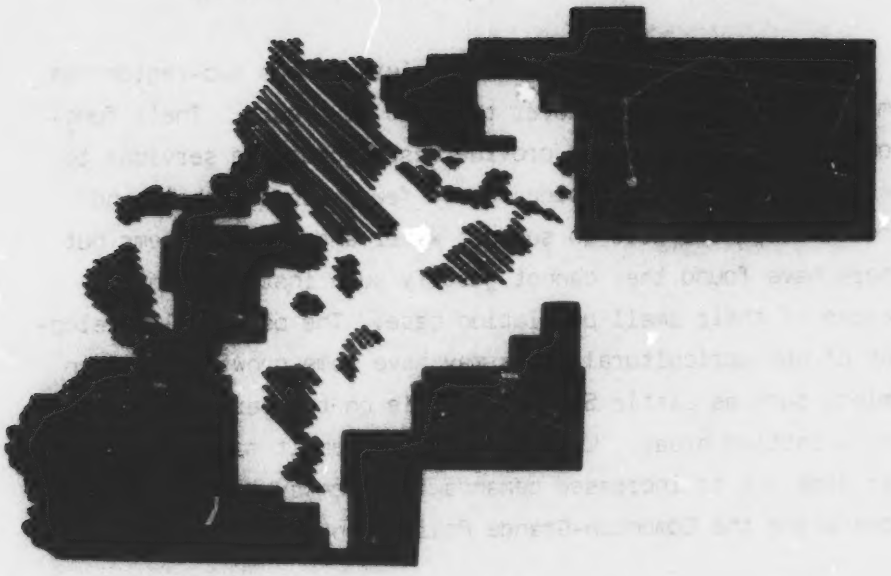
In addition to the centres cited, there are a number of unincorporated hamlets in the study area; these are generally stable and mature communities. Included among these are the hamlets of Grouard, located on the west end of Lesser Slave Lake, the Metis settlements of Gift Lake and Atikameg, and the farm communities of Debolt, Jean Cote, Reno, and Guy.

The population of most hamlets in the sub-region has remained fairly constant over the past few years. Their function remains primarily to provide basic goods and services to the surrounding rural residents. A few, such as Debolt and Crooked Creek are able to support water and sewer systems but others have found they cannot justify such installations because of their small population base. The potential development of new agricultural lands may have some growth impact on hamlets such as Little Smoky which lie on the periphery of presently settled areas. Little Smoky and Debolt may also benefit over time due to increased demands for highway commercial services along the Edmonton-Grande Prairie corridor.

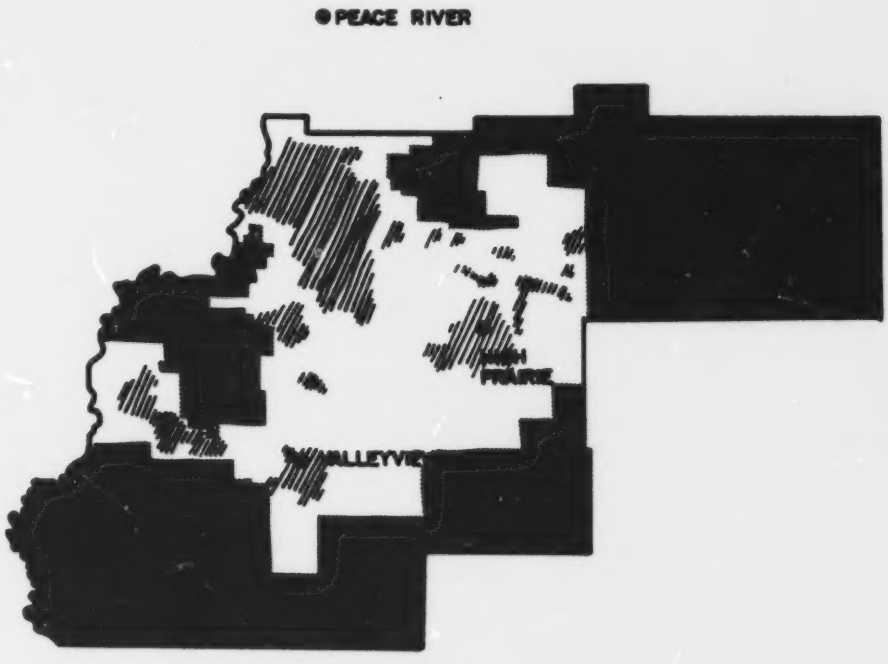
5.2.3 Rural Settlement

Rural settlement in the sub-region is concentrated in four major areas, these being M.D. 130, and the region lying between Valleyview and Little Smoky, to the north of High Prairie, and to the northwest of Sturgeon Lake -- as shown in Figure 3 which compares settled areas in 1958 and 1979.

The largest settled area, M.D. 130 is relatively stable and mature and on-going development is occurring largely by way of consolidation and accretion; the area to the north of High Prairie is similarly stable. Most of the new agricultural lands within the sub-region are being developed northwest of Sturgeon Lake and in the Valleyview area. Historical rates of land development within the four areas have amounted to 10,600



SETTLEMENT PATTERNS
(1979-1980)



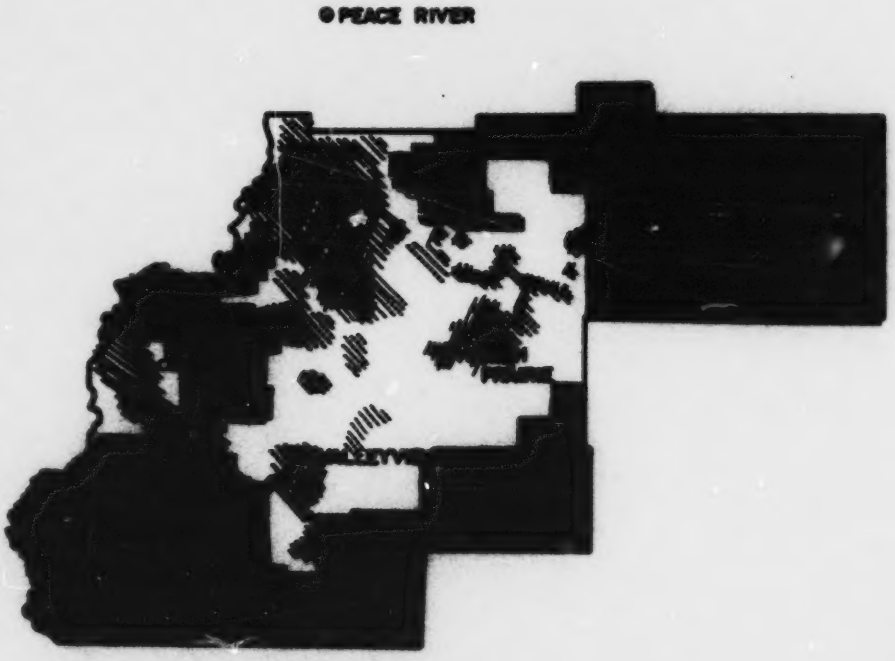
Legend

EASTERN PEACE SUB-REGION

Figure 3

SETTLEMENT PATTERNS
(1956)

Peter C. Nichols & Associates Ltd.



EASTERN PEACE SUB-REGION

Figure 3

SETTLEMENT PATTERNS (1956)

SETTLEMENT PATTERNS (1979-1980)

Peter G. Nichols & Associates Ltd.

hectares annually. Future expansion potential will continue to be concentrated in the latter two areas mentioned, although high clearing costs, 'green area' boundaries, and access problems due to difficult terrain will serve to pose constraints for further development. The pace of development is expected to fall off from historic levels despite unabated pressures for new lands to be opened.

5.3 DEMOGRAPHIC CHARACTERISTICS

5.3.1 Age and Sex Distribution

The population of the East Peace area is markedly younger than the provincial average, with 35.3% of the population under the age of 15, compared to 27.4% for Alberta. The difference is less significant within the age group 65 and over, which accounts for 6.4% and 7.2% of the population in the sub-region and the Province, respectively. The 1976 population age-sex pyramid for the sub-region is compared with that for the Province in Figure 4.

On an intra-regional basis, the urban centres have a smaller proportion of their population under the age of 15 than do the rural areas, while at the same time, with the exception of Valleyview, they have a greater percentage of their population above 64 years of age.

Under the assumption of a continuing decline in the birth rate to replacement levels, with zero migration, the proportion of the sub-regional population under the age of 15 and over the age of 64 will approximate the current provincial average by about 1986. Table 2 shows the 1976 and expected 1995 population distributions, assuming zero migration.

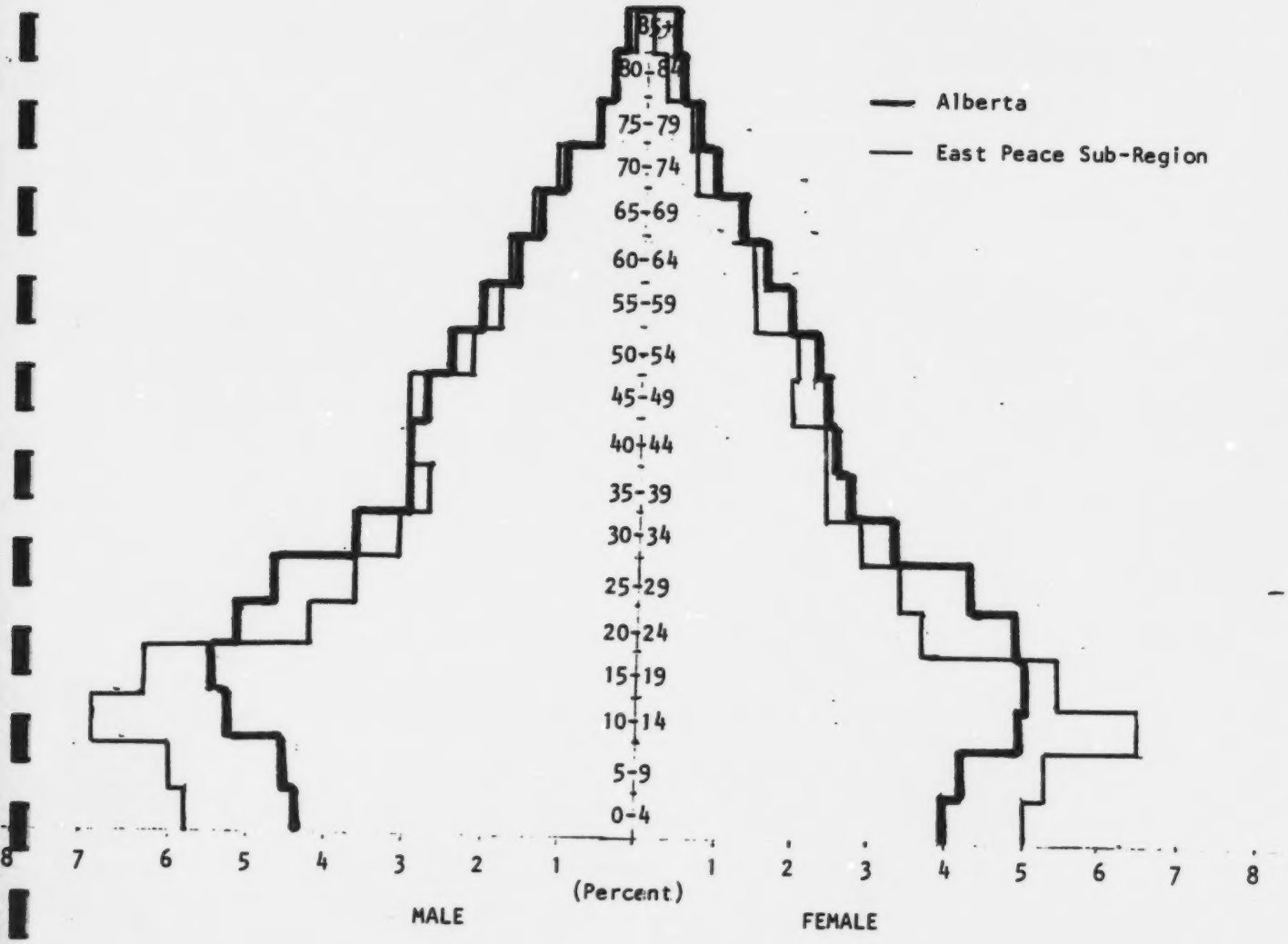


FIGURE 4. AGE-SEX PYRAMIDS FOR ALBERTA AND THE EAST PEACE SUB-REGIONS. 1976.

Table 2. Population distribution by age group, 1976 and 1995.[a]

SUB-REGION		AGE GROUP		
		0 to 14	15 to 64	65+
		(%)		
LOWER PEACE:	1976	44.5	52.6	2.9
	1995	26.6	68.0	5.4
EAST PEACE:	1976	35.3	58.3	6.4
	1995	25.7	65.0	9.3
NORTH PEACE:	1976	32.4	60.4	7.2
	1995	24.3	66.0	9.7

[a] Based on zero migration estimates of population.

Source: Statistics Canada, 1976 Census of Canada.
Peter C. Nichols & Associates Ltd.

The rate of natural increase for the sub-region has been about 1.7% per year compared to less than 1.2% for the Province (1971 to 1976 period). Because of the higher fertility rate and the younger population in the sub-region, the rate of natural increase should continue to be higher than the Alberta average for some time.

The proportion of males in the population is higher in the sub-region than the Province (52.1% versus 50.7%).

5.3.2 Size of Household

Family and non-family household sizes in the sub-region are, on average, higher than for the Province as a whole. In 1976, the average family in the sub-region comprised 3.9 persons compared to 3.5 for Alberta, while the comparable non-family household sizes were 3.6 and 3.1 persons, respectively. The largest family sizes are in the rural areas, M.D. 130 and I.D. 16 and 17, where they exceed four persons on average; family sizes in the urban centres approximate provincial levels.

5.3.3 Ethnic Composition

An indication of the ethnic composition of the sub-region can be derived by examining 1976 census data related to the mother tongue of respondents and the population of Indian Reserves and Metis Settlements.

It is estimated that roughly 15% to 20% of the sub-regional population is of native origin. This includes treaty Indians living on reserves, settlement Metis, and other native people living elsewhere in the region. These native people are geographically concentrated in the rural areas of I.D. 16 and 17.

English is, of course, the dominant mother tongue in the sub-region but a strong French influence is evident, particularly in M.D. 130 and the urban centres of Falher, Girouxville, and Donnelly. In those areas or localities, French is the mother tongue for more than 70% of the local population. For the East Peace in total, French is the mother tongue for one-quarter of the population, while German and Ukrainian are of subsidiary relative significance.

5.3.4 Education

The level of education in the sub-region lags considerably behind provincial levels, as suggested by Table 3, which compares the proportion of adults with less than grade nine education. Overall, 33% of the sub-region's adults have achieved less than grade nine compared to only 18% for the Province. The lowest levels of education are found in I.D. 17, while the highest prevail in Valleyview. Valleyview has a relatively high proportion of persons who have attained the post-graduate or university level probably reflecting the importance of the oil and gas sector in the immediate area. The rural areas generally show a lower percentage of their population with at least some post-secondary education than either the urban centres or the Province as a whole. Although the native people are gradually showing some improvement in their attendance at post-secondary institutions, it is still expected that their level is well below the provincial average.

5.4 REGIONAL INFRASTRUCTURE

5.4.1 Introduction

Over the past two decades, the East Peace has experienced a continuing improvement in the range and level of physical infrastructure available to its residents. This trend has

Table 3. Education levels of population aged 15 years and over, East Peace sub-region, Census Division 15, and Alberta, 1976.

	PERCENTAGE WITH LESS THAN GRADE 9			PERCENTAGE WITH SOME POST-SECONDARY OR UNIVERSITY		
	Male	Female	Total	Male	Female	Total
URBAN CENTRES						
High Prairie	32	28	31	27	28	28
McLennan	40	28	34	17	25	21
Falher	36	33	34	22	21	23
Valleyview	23	22	23	37	31	33
Girouxville	45	20	33	27	25	26
Donnelly	32	18	26	36	35	33
RURAL AREAS						
M.D. 130	35	24	30	15	18	16
I.D. 16	34	26	31	18	19	19
I.D. 17[a]	46	38	42	20	18	19
TOTAL SUB-REGION[a]	36	29	33	21	21	21
CENSUS DIVISION 15	32	25	28	26	25	26
ALBERTA	20	17	18	36	34	34

[a] Excludes Indian Reserves.

Source: Adapted from Alberta Bureau of Statistics. 1976 Census of Canada Community Profiles.

been generalized throughout the Province, of course, but it has also been prompted by the on-going development and growth of northern Alberta. The central part of the region, though not heavily populated, is a relatively mature one and supports a high standard of services. Nonetheless, the East Peace comprises significant areas that are sparsely settled, predominantly native, and remote, particularly in the eastern regions. There is little question that infrastructure standards there lag behind many other parts of the Province.

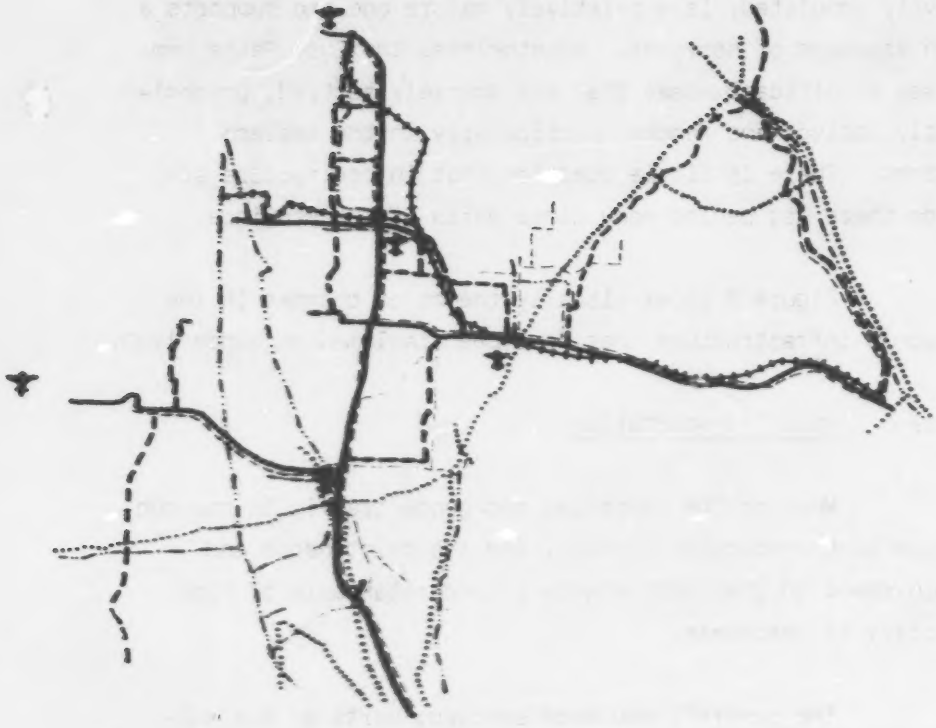
Figure 5 shows visually the major changes in the region's infrastructure that have been implemented since 1960.

5.4.2 Road Transportation

Most of the passenger and goods traffic in the sub-region is transported on roads, and the maintenance and improvement in the road network is understandably of high priority to residents.

The central, and more settled, parts of the sub-region are well served by main highways. Two alternative routes link the sub-region to the Edmonton area. Highway 2 extends east through High Prairie and Slave Lake before turning south, while Highway 43 extends in a south-easterly direction through Valleyview. Both these routes connect with Highway 2, which serves as the main north-south axis through the sub-region, with the Town of Peace River as its northern node.

The route from Edmonton to Valleyview also connects to Highway 34, leading to Grande Prairie and the Alaska Highway. Valleyview, therefore, serves as an important road junction to both the north Peace and west Peace areas.



SUB-REGION INFRASTRUCTURE
(1979-1980)

Legend

- PAVED HIGHWAY
- GRAVEL HIGHWAY
- RAILWAY
- OIL PIPELINE
- GAS PIPELINE
- TRANSMISSION LINE
- AIRPORT

0 25 KM

0 10 20 30 40 50 miles

EASTERN PEACE SUB-REGION

Figure 5

SUB-REGION INFRASTRUCTURE
(1958-1960)

Peter C. Nichols & Associates Ltd.

Legend

PAVED HIGHWAY
GRAVEL HIGHWAY
RAILWAY
OIL PIPELINE
GAS PIPELINE
TRANSMISSION LINE
AIRPORT

EASTERN PEACE SUB-REGION

Figure 5a

SUB-REGION INFRASTRUCTURE (1958-1960)
SUB-REGION INFRASTRUCTURE (1979-1980)

Peter C. Nichols & Associates Ltd.

The main remaining route in the East Peace is Highway 49, which connects the four incorporated centres of Girouxville, Falher, Donnelly, and McLennan to Spirit River and Dawson Creek in the west and High Prairie in the east.

No major changes in the road network of the East Peace are foreseen at this time, although continuing upgrading and access improvements will be undertaken to accommodate traffic growth and settlement developments in the region.

5.4.3 Rail Transportation

The Northern Alberta Railway (NAR) has been in operation in the Peace River region since 1917 and provides service to all incorporated centres in the East Peace sub-region other than Valleyview. No recent railway developments have occurred in the area.

A recent study (Deloitte Haskins and Sells Associates and Stanley C.D. Howe Associates, 1980) has examined alternative means of improving grain shipments from the Valleyview area of the sub-region. The alternatives examined included the extension of the Canadian National Railway line from Kaybob (near Fox Creek). The study concluded, however, that these railway developments were not economically viable options.

5.4.4 Air Transportation

All incorporated communities in the East Peace have access to air transportation facilities: High Prairie and Valleyview have paved and lighted airstrips with terminals, while Donnelly, Falher, Girouxville, and McLennan share the Smoky River Regional Airport. Gift Lake is served with a turf airstrip. There is no regular air service to the sub-region, but schedule flights to and from Peace River and Grande Prairie

are available. The airports in the region are used by private and charter aircraft, including air ambulances.

5.4.5 Pipelines

The discovery and development of oil and gas fields in northwestern Alberta have resulted in the construction of a number of pipelines in the sub-region. There are a number of natural gas distribution lines serving communities in the East Peace. In addition, two major gas transmission lines owned by NOVA (formerly Alberta Gas Trunk Lines) pass through the area from the north, and also connect into gas fields located in the Valleyview area. The Peace Pipe Lines system, which transports crude oil, extends through the area from the Utikuma Lake area and connects into oil fields south-west of High Prairie and in the Valleyview areas. There are, in addition, a number of other pipelines in the sub-region, as shown in Figure 5.

5.4.6 Communications

Communications in the sub-region have improved over the years. Telephones are connected to virtually all settlements in the area. Radio and television reception is available to residents, who have a wider range of station selection than they were offered a few years ago. Local newspapers are published at Valleyview, Falher, and High Prairie. Scheduled bus services are available to all incorporated communities, although the more isolated settlements such as Grouard, Gift Lake, and Atikameg do not have direct access to bus connections.

5.4.7 Utilities

Electricity is generally available throughout the sub-region through the interconnected provincial grid system, except in a few isolated communities which have independent

power sources. Atikameg has been identified as having potential linkage with the grid system. Natural gas is available to most centres, but Gift Lake, Atikameg, and East Prairie remain exceptions to this. All incorporated centres, and hamlets such as Debolt and Grouard, have piped water and sewer systems but smaller communities such as East Prairie, Big Prairie, Enilda, Gift Lake, and Atikameg, still depend on individual or community wells or unpiped surface water with varying degrees of treatment, for their water supply. In these instances, septic tanks or privies are used for sewage disposal.

5.4.8 Development Priorities

Representatives of each of the municipalities in the sub-region were contacted during the course of the study and queried as to the major infrastructure priorities and deficiencies that they perceived in the local area. Most of the concerns that were expressed related to roads, water and sewer facilities, and housing.

Road improvements are of particular importance to the smaller centres and rural areas. Improved road access into newly settled areas of I.D. 17 and the Metis settlements, particularly to Gift Lake, was considered important. The road leading from Girouxville south to the provincial campground was paved in 1980 and the extension north to the Town of Peace River has also been mentioned for possible paving.

Water and sewer facilities are considered deficient in the smaller unincorporated centres, including Grouard, East Prairie, Big Prairie, and Gift Lake. Planning has also commenced regarding the water and sewer service requirements of Little Smoky.

The representatives of four centres specifically mentioned a shortage of housing accommodation: Donnelly, High Prairie, McLennan, and Valleyview. In the case of the latter two communities, the unavailability of rental housing is of particular concern. In native communities, the quality of housing tends to be poor and often lacks basic amenities.

5.5 SERVICES

5.5.1 Introduction

The local availability of government and commercial services in the sub-region has grown over the years, and particularly in the past decade, in response to the growth of the economy and population of the East Peace generally and, in respect to senior government functions, to the pursued policy of administrative decentralization. The development and status of sub-regional services are reviewed briefly below.

5.5.2 Public Administration

Local government services in the sub-region are provided by the municipal jurisdictions, in the case of the incorporated urban centres and M.D. 130, or by appointed officials of the Alberta Department of Municipal Affairs, in the case of I.D. 16 and 17. The administration of the Improvement Districts has become increasingly decentralized, with greater responsibilities for the delivery of services placed in the hands of advisory councils and district managers.

Over the years, the provincial and federal governments have increased their representation and presence in the region, in terms of providing senior government services. With the exception of postal services, federal government services in the sub-region are concentrated at High Prairie and

primarily involve administration and assistance to Indians in the sub-region through the Indian and Inuit Affairs Branch, and manpower and employment services.

The provincial government has more than 250 full-time employees in the sub-region, primarily at High Prairie (129), Grouard (76), and Valleyview (36). The Department of Advanced Education and Manpower is the largest departmental employer, with its training services at Grouard, followed by Social Services and Community Health, Transportation, Treasury (Treasury Branches), and Energy and Natural Resources.

Although the East Peace is more self-sufficient in terms of the local availability of government services than is, for example the Lower Peace area, it is evident that many services to the region are provided from Edmonton or Peace River, which is within reasonable travelling distance. It can probably be anticipated that sub-regional provincial employment will increase in the future commensurate wth population growth and development, but that the administrative hub for the East Peace will continue to be located outside the region.

5.5.3 Commercial Services

The commercial structure of the sub-region has evolved over the years with the growth of incomes and the size of the resident population. The commercial sector is concentrated in the urban centres and the most significant expansion has occurred in the larger communities, particularly High Prairie, Valleyview, and Falher. Growth has been experienced also in the smaller incorporated centres and a number of hamlets, but this has been largely confined to low-order services,

including automotive service stations, general stores, cafes, and grocery stores.[1]

The sub-region has three dominant middle-order centres (High Prairie, Valleyview and Falher) which account for more than four-fifths of total retail and service activity. The range and sophistication of the local business sector in these communities has grown over the years but the opportunity for the sub-region to spawn a high-order centre is constrained by the limited population and growth potential, the competition from a relatively large number of urban centres, and the proximity of such high-order service centres as Grande Prairie, Peace River, and to a more limited extent, Edmonton. The sub-region is a relatively mature one, and is characterized by many communities trying to service the available market. This, in turn, reduces the scope for any of them to become a dominant high-order centre.

Competition to the sub-regional commercial sector is likely to increase in the future as Grande Prairie and Peace River reach higher threshold sizes which can support larger and more specialized retail and service facilities. This aside, the availablility of low- and middle-order services is likely to grow in the future in relation to increases in the local

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1 Low-order functions are those which appear first in a developing centre. They include convenience goods and services such as grocery stores, gasoline stations, cafes, and elementary schools.

Middle-order functions are those which supply goods and services which are required less frequently, and would include liquor stores, hardware stores, and hospitals.

High-order funtions are generally found only in cities and large towns and the related goods and services are those for which the consumer may comparison-shop. These would include major appliances, automotive dealerships, dental and legal services, and advanced-education institutions.

population and income levels, as well as the anticipated expansion in highway, tourist and commercial traffic through the sub-region.

6. ECONOMIC BASE

6.1 INTRODUCTION

This chapter of the report examines the economy of the East Peace sub-region. It begins with a short review of the historical economic development of the sub-region; this is followed by a discussion of existing economic base characteristics, as reflected through relevant employment and income statistics. Most important, in the context of the study objectives, is the analysis of future economic growth, which has been carried out on an industry by industry basis, and is summarized in the concluding part of the chapter.

6.2 BACKGROUND

Until the twentieth century, hunting, fishing, and trapping by native people constituted the major form of economic activity in the East Peace. During the first two decades of the 1900's, the lands in the sub-region, particularly in the northwestern areas, were opened for agricultural settlement and farming is today the most important sector in the economy. Most potential arable lands have by now been developed however, and the industry must be considered a mature one.

The importance of the forestry and petroleum sectors dates primarily from the 1950's and 1960's. The economic significance of forestry activities is concentrated in the eastern parts of the sub-region, in the High Prairie and Gift Lake areas, while the oil industry is focussed on the Valleyview area.

The economic base of the sub-region has been generally stable in recent years. The consolidation pattern evidenced in the agricultural sector has been offset by some

increased activity in the oil and gas, forestry, and service sectors. It appears that many of the basic natural resources of the sub-region are approaching full development and that the primary industries will provide a minimal source of economic impetus. Significant future development will probably require an emphasis on the expansion of secondary and tertiary industry activities.

The development in the East Peace has not been uniform and the native communities, particularly, lag far behind the rest of the sub-region in terms of participating in the economic growth of the sub-region.

6.3 EMPLOYMENT STRUCTURE

6.3.1 Industry Employment

The 1971 employment composition by industry of the East Peace sub-region, Census Division 15, and Alberta is compared in Table 4. Although this data are now several years old and some shifts in industry composition have undoubtedly occurred in recent years, the Table does serve to provide a general indication of the economic base of the sub-region.

The industry composition of the East Peace is quite similar to that for the Peace River region taken as a whole, but differs significantly from the overall Alberta pattern. Primary industries accounted for 33% of all jobs in the sub-region, compared to a rate of one-half that for the Province as a whole. The agriculture sector provided the bulk of the primary employment, followed distantly by the oil and gas sector.

All remaining industries in the sub-region are under-represented by provincial norms, particularly with respect to manufacturing and retail and wholesale trade. The data suggest

Table 4. Labour force composition by industry, Alberta, Census Division 15, and the East Peace sub-region, 1971.[a]

	ALBERTA %	CENSUS DIVISION 15 %	EAST PEACE SUB-REGION[b] %
PRIMARY INDUSTRIES:			
Agriculture	12.6	22.8	26.5
Forestry	0.3	2.2	1.6
Fishing and Trapping	0.0	.2	0.3
Mines and Oil Wells	3.9	5.6	4.1
Sub-Total	16.8	30.8	32.5
MANUFACTURING	9.1	5.6	5.1
CONSTRUCTION	7.6	7.2	7.1
TRANSPORTATION, COMMUNICATIONS, UTILITIES	7.9	7.2	6.9
TRADE	15.1	11.6	10.7
FINANCE, INSURANCE AND REAL ESTATE	3.7	2.0	2.1
COMMUNITY, BUSINESS AND PERSONAL SERVICES	24.5	20.1	22.7
PUBLIC ADMINISTRATION AND DEFENCE	7.9	6.7	5.3
INDUSTRY UNSPECIFIED	7.4	8.8	7.6
	100.0	100.0	100.0

a Adapted from original tables in Statistics Canada. Census of Canada. 1971.

b Includes incorporated centres, plus I.D. 126 and 125, and M.D. 130. I.D. 126 is now part of I.D. 17; I.D. 125 is part of I.D. 17.

Note: Indian Reserves are excluded.

that extra-regional centres are relied upon to provide many business and governmental goods and services to East Peace residents.

6.3.2 Occupational Employment

The most recent information that is available regarding occupational patterns in the sub-region must be derived from 1971 Canada Census data. Table 5 provides a comparison of the composition of the labour forces as between Alberta, Census Division 15, and the sub-region. In terms of managerial, professional and technical, clerical, and sales and service occupations, the number of jobs in the sub-region is about three-quarters of the provincial level. On the other hand, the relative number of jobs in the primary sectors, including farming, forestry, and oil field work, is over twice the Alberta average. Manufacturing, processing and construction occupations are under-represented in the sub-region, but transport and material handling positions account for a relatively high percentage of the labour force.

6.3.3 Labour Force Participation

Table 6 compares historical labour force participation data for Alberta, Census Division 15, and the East Peace sub-region. The sub-regional data, which exclude Indian Reserves, suggest that labour force participation rates are now marginally above provincial levels -- 67.1% compared to 65.4% in 1976. In 1971, participation rates for the sub-region were below the provincial average. Approximately the same percentage of the total sub-regional population is employed as for the Province.

Table 5. Composition of the labour force by occupation, Alberta, Census Division 15, and the East Peace sub-region, 1971.[a]

	ALBERTA	CENSUS DIVISION 15	EAST PEACE SUB-REGION[b]
		-%-	
Managerial and Administrative	4.3	2.8	2.9
Natural Sciences, Engineering, Maths	3.2	1.6	0.4
Social Sciences	0.9	0.7	0.7
Religion	0.3	0.4	0.3
Teaching	4.5	4.7	5.2
Medicine and Health	4.4	3.2	4.1
Artistic, Literary, Performing Arts	0.8	0.2	0.3
Clerical	15.9	9.2	7.7
Sales	10.5	8.0	6.9
Service	12.7	11.2	11.4
Farming, Horticultural, Animal Husbandry	14.1	25.3	29.1
Fishing, Hunting and Trapping	0.0	0.2	0.2
Forestry and Logging	0.3	2.3	2.3
Mining and Quarrying Including Oil and Gas Fields	1.2	3.3	2.9
Processing	2.4	2.6	2.1
Machining	1.8	1.3	1.3
Product Fabricating, Assembling and Repairing	4.9	4.0	2.9
Construction Trades	8.2	7.8	7.0
Transport Equipment and Operating	4.2	4.9	4.8
Material Handling	2.4	3.7	4.6
Other Crafts and Equipment Operating	1.1	0.9	1.0
Occupations not elsewhere classified	1.9	1.7	1.9
	100.0	100.0	100.0

a Adapted from original tables in Statistics Canada. Census of Canada 1971. Disregards "occupations not stated".

b Includes incorporated centres, I.D. 125, I.D. 126, and M.D. 130. I.D. 125 and I.D. 126 comprise portions of I.D. 17 and I.D. 16, respectively.

Note: Indian Reserves are excluded.

Table 6. Labour force participation, East Peace sub-region, Census Division 15, and Alberta, 1971 and 1976.[a]

	EAST PEACE SUB-REGION[b]		CENSUS DIVISION 15		ALBERTA	
	1971	1976	1971	1976	1971	1976
LABOUR FORCE PARTICIPATION RATE (%)						
Male	74.3	78.2	78.4	80.5	80.5	79.6
Female	36.7	54.2	40.2	51.0	44.4	51.0
Overall	56.9	67.1	60.8	66.6	62.7	65.4
EMPLOYED LABOUR FORCE AS % OF POPULATION 15 AND OVER	53.1	65.2	57.5	64.1	58.7	62.8
EMPLOYED LABOUR FORCE AS % OF TOTAL POPULATION	37.7	46.0	36.3	42.1	40.2	45.6

a 1971 figures adapted from original table in Statistics Canada, Census of Canada 1971, and Alberta Department of Business Development and Tourism, Industry and Resources, 1975. 1976 figures taken from 1976 Census of Canada, Community Profiles, Alberta Treasury.

b Excludes Indian Reserves.

As indicated, the data in Table 6 exclude Indian Reserves, which comprise an important part of the population in I.D. 16 and 17. Labour force participation rates in the Reserves are undoubtedly below those observed for the remainder of the sub-region and hence, the table likely overstates the relative level of employment activity in the East Peace.

Within the sub-region, there are some differences in participation levels between the urban and rural areas. In 1976, 70% of the working age population of the rural areas were involved in the labour force, compared to less than 63% in the urban areas. Similarly, 49% of the rural population was employed, compared to 42% in the towns and villages.

6.3.4 Employment Patterns

The petroleum and forestry industries in the sub-region serve to complement the agricultural industry by providing seasonal winter employment to local farmers. The relative importance of this off-farm employment is greater in the agricultural areas of I.D. 16 and 17 than it is in M.D. 130. The latter is a more mature farming area and farther removed from resource developments in the non-settled parts of the sub-region. More than one-half of farmers in I.D. 16 and 17 engage in off-farm work compared to a rate of slightly more than one-third in M.D. 130 (Alberta Department of Agriculture, June 1978).

The predominance of winter employment opportunities in the resource industries is reflected in higher levels of economic activity in the native communities during those months. Logging, brushing and clearing, and road construction together with fishing and trapping provide much of the seasonal employment in the native areas. Works projects, firefighting, and housing construction offer more limited job opportunities

in the summer months. It is evident however, that income and employment levels in the Indian and Metis communities lag considerably behind those of the rest of the sub-region.

6.4 INCOME LEVELS

It is quite difficult, on the basis of available statistical data, to estimate per capita and family or household incomes on a sub-regional or local level. However, household income figures can be derived from 1971 Canada Census data and taxation statistics to 1977 are available on a sub-provincial basis for various localities. These data sources can be analyzed to determine a rough measure of relative income levels in the sub-region.

Table 7 compares 1971 household incomes in the East Peace sub-region with those in Alberta. It would appear that household incomes in the sub-region, generally, are well below provincial levels, but that there are marked differences between the urban and rural areas, with urban incomes lagging only moderately behind provincial levels. Valleyview is unique in this regard, with incomes appearing to substantially exceed provincial levels; this undoubtedly reflects the resource-based nature of its local economy.

Table 8 also demonstrates that relative income levels in the sub-region are below those in Alberta and Census Division 15, although the differential with provincial levels appears to have narrowed over the past decade.

A very approximate assessment of relative per capita and household incomes in the East Peace compared to the Province has been made, by adjusting the income data from Table 8 to reflect different labour force participation rates and household sizes. It is estimated that from 1967 to 1977

Table 7. Household incomes, Alberta and East Peace sub-region, 1971.[a]

	HOUSEHOLDS WITH INCOMES IN INDICATED GROUP OR BELOW					
	Less than $3000	$3000 to $4999	$5000 to $6999	$7000 to $9999	$10000 to $14999	More than $15000
	- cumulative percentage -					
ALBERTA	17	30	43	64	87	100
EAST PEACE SUB-REGION						
Urban Centres						
High Prairie	25	38	53	73	91	100
Valleyview	9	19	32	58	85	100
McLennan	25	38	43	72	87	100
Falher	31	42	55	74	91	100
Girouxville	25	37	56	75	94	100
Donnelly	30	44	65	65	86	100
All Urban Centres	22	34	47	69	89	100
Rural Areas	44	62	76	88	95	100
Total Sub-Region	32	47	60	78	92	100

[a] Adapted from original tables in Statistics Canada. Census of Canada. 1971.

Table 8. Income and taxation statistics, Alberta, Census Division 15, and East Peace sub-region, 1967 and 1977.[a]

	AVERAGE INCOME OF TAX RETURNS	
	1967	1977
ALBERTA	$4 454	$12 085
CENSUS DIVISION 15	$3 344	$10 974
- % of Alberta	75%	91%
EAST PEACE SUB-REGION		
M.D. 130 - including McLennan, Donnelly, Falher, Girouxville	$3 084	$ 9,369
- % of Alberta	69%	78%
I.D. 16 - rural parts of sub-region including Valleyview	$3 147	$9 139
- % of Alberta	71%	76%
I.D. 17 - rural parts of sub-region including High Prairie	$2 989	$ 9 077
- % of Alberta	67%	75%
Total Sub-Region	$3 073	$ 9 192
- % of Alberta	69%	76%

[a] Adapted from original tables in Canada, Department of National Revenue. Taxation Division (1967 to 1977).

Note: The statistics in the table are based on the mailing addresses of the returns filed with Revenue Canada.

average per capita incomes in the sub-region increased from 65% to 77% of the Alberta level, while average household incomes increased from 75% to 89% of provincial norms. The income differential for households is not as significant due to the larger household sizes in the sub-region.

6.5 ECONOMIC GROWTH AND DEVELOPMENT

6.5.1 Introduction and Methodology

The major purpose of this study is to evaluate and to assess the prospects and implications of growth in the sub-region over the next 15 years. The authorities concerned with the study area are particularly concerned with projections of population and employment, since these factors drive the demand for many types of services and facilities.

The model adopted in this report for the purposes of projecting population and employment in the sub-region to the year 1995 is based on the demand-supply relationships of labour. The principle that is applied is that employment growth determines the level of labour force that will be employed; the required labour force, in turn, can be met by means of changes in the structure of the labour market, for example, the rate of participation in the work force, or through in-migration or out-migration from the area. In summary, the model is demand-based, with employment projections developed in order to estimate the population growth needed to provide the required labour force.

The most common method used to estimate future employment is through an analysis of basic and non-basic employment. It is assumed that all employment falls into one of these two categories.

The basic employment of a region is export-oriented, providing goods and services to external markets. Basic employment can consist of goods-producing jobs in the primary or manufacturing sectors. It can also include service employment in which essential services are provided to markets outside the region. The amount of basic employment in a region can be affected by development in its external market area -- for example, a tendency toward greater self-sufficiency in the "export market" served by a region can reduce the scope for increases in its own basic employment.

Non-basic employment includes employment related to the provision of goods and services to the local population or market and is therefore internally established. Over time, the amount of non-basic employment in a region can increase as it becomes more self-sufficient and less dependent on goods and services from outside its boundaries.

Expansion of basic employment activities will generate earnings which will support jobs in other non-basic sectors. That is, an exogenous impetus to the local economy arising from new basic employment activities will result in a number of re-spending cycles which will raise local incomes and employment by some multiple of the original increase. This expansion of the initial spending and employment is known as the multiplier process. An employment multiplier is a measure of the total change in employment generated in the study area economy for each change of one job in the export or basic sector. For example, a multiplier of 1.5 means that for each new job created in a basic sector, another one-half job is supported indirectly. The size of the multiplier is to an important degree a function of the size and economic diversity of a region; to the extent that a high percentage of income receipts are spent locally, the size of the multiplier will be enhanced.

The development of employment forecasts in the basic industry sectors is, then, an important part of the economic growth study. In the East-Peace sub-region, these primarily include the goods-producing sectors related to the resource industries (agriculture, forestry, oil and gas, and resource processing). The service sectors in the sub-region perform largely a non-basic function. The sections that follow review each of the main industry sectors in the study area, with emphasis on the basic industries. The historical and present situation with respect to the various economic sectors is examined, and more importantly, their outlook in terms of future development and employment. A later part of the report (Section 7) will summarize the related employment impacts and derive population projections for the sub-region.

6.5.2. Commercial Fishing

Commercial fishing in the East Peace is concentrated in I.D. 17 -- in the Lesser Slave Lake area -- although Sturgeon Lake in I.D. 16 is also fished commercially. The main fish species caught commercially include whitefish, tullibee (cisco), northern pike, walleye, and perch. Fishing is generally confined to a maximum one to two month period during the year and provides strictly seasonal and short-term employment activity.

Total fish production in the sub-region, including Lesser Slave Lake which bounds the region on the southeast, has varied between 181,000 kilograms and 408,000 kilograms (0.4 million pounds and 0.9 million pounds) annually over the past six years and amounts to more than one-third of provincial production. Output has also been increasing, and generally consistently, over the past several years. The value of production to fishermen totalled $0.2 million in 1979. Production figures for the sub-region are shown in Table 9.

Table 9. Commercial fishing production, East Peace sub-region, 1973 to 1979.[a]

YEAR	STURGEON	SNIPE	BRINTNELL	NIPISI?	LESSER SLAVE	TOTAL PRODUCTION	TOTAL VALUE TO FISHERMEN
	pounds						- $ -
1973-74	37 677	18 401	13 912	18 596	280 501	369 087	59 199
1974-75	42 680	15 421	10 270	20 654	498 720	587 754	114 357
1975-76	56 515	2 502	13 500	5 839	398 467	476 823	116 840
1976-77	46 718	7 685	15 555	12 170	653 408	735 536	128 515
1977-78	47 168	21 400	13 291	8 249	790 529	880 637	152 405
1978-79	36 821	17 247	15 664	--	877 127	946 859	191 323

[a] Alberta Department of Recreation, Parks, and Wildlife. Annual Fisheries Statistics. Fish and Wildlife Division.

Historical production levels for the Lesser Slave Lake area have occasionally exceeded current levels and the lakes have been vulnerable to periodic overfishing followed by a collapse in production. Discussions with Alberta fisheries officials have indicated that current production levels meet or exceed the sustainable yields of the lakes concerned.

Commercial fishing is of most economic significance to the native people in the Lesser Slave Lake-Utikuma area. Sturgeon Lake, in I.D. 16, has limited commercial importance and functions more as a recreational fishery. In 1979, 104 'zone' commercial licenses were issued for the Lake as well as 29 'domestic' licenses to Indians.

The major impact of the fishing industry in the sub-region is to the Utikuma Lake Metis Colony, which is allocated 50% of the whitefish quota on Utikuma Lake, involving the participation of some 30 to 50 local Metis residents. In the I.D. 17 portion of the sub-region, the 1980 quota was taken by 31 Metis fishermen and 154 Indian or non-native fishermen. Except for the native participants in the industry, the remaining employment and income impact accrues largely to residents from outside the sub-region, particularly in the Faust and Kinuso areas. The overall allocation of licenses for lakes in the sub-region is shown in Table 10.

According to regional fisheries officials (letter dated 31 July 1980 from F. Bishop, Regional Fisheries Biologist, Alberta Energy and Natural Resources), the lakes in the sub-region are currently being fished at or near maximum levels and that, indeed, there may be too many licenses being issued at present. Although there is some potential for increasing the production of coarse fish species, the opportunity to expand the economic importance of commercial fishing in the East Peace is considered limited.

Table 10. Licenses issued for fishing in East Peace sub-region, 1978 to 1979 season.[a]

LAKE	LICENSES ISSUED			
	Zone Commercial	Domestic		
		Indian	Metis	Other
Sturgeon	104	29	--	--
Snipe	2	1	--	--
Lesser Slave	28	32	--	31
Utikuma	118	34	2	2
Utikumasis	--	37	31	6
Long	1	--	--	--
Brintnell	--	1	--	1
Gift	--	1	--	--
TOTAL	253	135	33	40

a Alberta Department of Recreation, Parks, and Wildlife. Zone License Summary. Fish and Wildlife Division.

6.5.3 Hunting and Trapping

Hunting and trapping is a traditional native activity in the sub-region providing a source of domestic food, an income supplement, and a way of life for a number of people. In terms of the sub-region as a whole, the economic importance of hunting and trapping is limited but it is significant in a localized sense among predominantly native communities and in sparsely settled areas.

Although trapline districts analyzed statistically by the Fish and Wildlife Division of the provincial government are not coterminous with the sub-regional boundaries used in this report, it is estimated that the study area accounts for about 8.1% of Alberta registered trapper fur production, valued at about $0.4 million in the trapping year ended 1979. Four hundred and sixty trappers are registered in the High Prairie and Valleyview districts but a proportion of those would have traplines outside the study area. An estimated two-thirds of the trappers are native. These numbers do not include those trappers who carry 'Resident' licenses for trapping on private land, nor Indians or Metis who are authorized to trap on Indian Reserves and Metis Settlements.

Fur production in Alberta over the past decade has remained relatively constant although value of output has increased significantly in recent years with improved fur prices. Discussions with fish and wildlife officials suggest that a change is occurring in the trapping sector in which participants view it as a supplementary or part-time, rather than a full-time, source of employment. This process is expected to continue as the current generation of trappers, who have an average age of about 45 years, move out of the industry. They are likely to be replaced by younger adults who do not wish to trap on a full-time basis.

Based on the findings of an earlier report on the trapping industry (Alberta Department of Recreation, Parks, and Wildlife 1977), it is estimated that the average revenue per registered trapline in the East Peace amounted to approximately $1,600 annually during the period 1970 to 1975. Another study (Alberta Department of Energy and Natural Resources, 1979) based on detailed surveys of registered trappers showed that 90% of registered trappers in High Prairie and Valleyview earned under $3,000. Such figures can be used as only a general indication of income, because of the unstructured or informal nature of the industry and potential inaccuracies or incompleteness of published data. Notwithstanding this, it is evident that average incomes earned by trapping are quite low.

Trapping in the sub-region is perceived to be of stable or moderately declining importance in the future, with a continued trend from a full-time to a casual or part-time source of employment activity. It will continue, however, to serve as an important cultural way of life to native residents and as a supplementary source of income to many people.

6.5.4 Agriculture Sector

6.5.4.1 Background. Farming in the East Peace sub-region began in the early 1900's and the size and importance of the agricultural sector increased continuously over many years. In 1971, the sector accounted for more than 28% of the employment in the sub-region, and in the rural areas, for 51%.

Farming is largely concentrated in the northeast corner of the sub-region within M.D. 130, to the northwest of Sturgeon Lake, scattered areas north of High Prairie, and the region between Little Smoky and Valleyview. The distribution of agricultural land in the East Peace is as follows: I.D. 16, 38%; I.D. 17, 28%; M.D. 130, 34%.

The agriculture sector in the study area has largely stabilized and matured, although new lands continue to be added in the fringe areas. The amount of land farmed within the sub-region continues to grow at the rate of 2.5% annually, however all of this growth is concentrated in the Improvement Districts. Despite this growth the trend towards farm consolidation and increased farm sizes has brought with it a declining farm population. Between 1966 and 1976, the farm population fell from an estimated 8860 to 6410, or about 3.3% annually. This is only slightly less than the rate experienced in rural Alberta taken as a whole.

The average farm in the sub-region comprises about 310 hectares (766 acres), compared to 350 hectares (864 acres) for the Province.

Agricultural production within the sub-region is dominated by barley and rapeseed, although forage crops and wheat are also important. The high proportion of rape and forage crops has given rise to a large auxiliary beekeeping industry and to a lesser extent, to livestock production.

Constraints to further development in the agricultural sector include grain delivery problems in the south-western part of the region, the high cost of land expansion, and the difficulties of reallocating forestry reserves to agricultural use. A number of individuals interviewed during the course of the study feel that the development of secondary honey and livestock processing facilities is frustrated by current transportation rate structures which favour extra-regional processing. As well, lack of rail facilities in the Valleyview area imposes additional transportation costs on local farmers who must haul their grain to the railhead at High Prairie or Grande Prairie. Expanded grain output can be realized by reducing the high rate of summerfallowing. Future land

development will be restricted due to the high costs of clearing and providing road access, particularly in the Valleyview area. The Forest Management Areas allocated to Procter and Gamble and North Canadian Forest Industries will also limit the encroachment on forest areas for agricultural development.

Farm incomes within the sub-region vary substantially between mature farming communities within M.D. 130 and the growing agricultural sectors in the Improvement Districts. In 1976, less than 40% of the farmers in the latter areas earned gross revenues of $10,000 or more, whereas in M.D. 130 more than 60% of farmers had revenues exceeding $10,000. This compares to 50% for Census Division #15 and 60% for Alberta farmers (Statistics Canada, 1976 Census of Agriculture). Off-farm work is prevalent within the sub-region and ranged from 38% in M.D. 130 to 51% and 56% in I.D. 17 and I.D. 16, respectively during 1975 (Alberta Department of Agriculture, June 1978). Rates of off-farm work in the Improvement Districts exceeded Alberta levels, but those in M.D. 130 were comparable to provincial averages. The degree of off-farm work in the East Peace fluctuated considerably during the period 1960 to 1975, and have recently been decreasing, in contrast to provincial figures which have shown a steady increase during the same period.

The outlook for the agricultural sector in the sub-region is one of moderate new land expansion, particularly in the Improvement Districts, and of increased yields as better grains are developed and improved land management practises take hold among farmers. Consolidation into larger farm units is expected to continue, especially in the more established areas.

6.5.4.2 Development outlook. Significant departures from historical agricultural development trends in the sub-region are not expected to occur in the future. M.D. 130 is largely developed and settled. Projections of land development to 1990 contained in another report (Deloitte Haskins & Sells Associates and Stanley C.D. Howe Associates 1980) suggest that improved land in that muncipality may increase by about 1.2% annually.

Greater potential for new land development exists within the Improvement Districts although this, too, is limited. Discussions with provincial agriculturalists and lands officials in the region indicate that remaining arable land in the northwest corner of I.D. 17 near McLennan -- where the development of new land has occurred in recent years -- lies in higher elevations and currently is in the 'green area' with good commercial timber potential. Development towards the southeast, in the Snipe Lake area, will be constrained by the Swan Hills as well as the commercial timber potential there. Modest amounts of land, in the order of 1000 hectares per year, are being opened for development in the High Prairie area.

Somewhat more land is available in I.D. 16. Much of this is on the east side of the Little Smoky River and north of the Hamlet of Little Smoky. Other, smaller pockets exist to the west of Little Smoky, southwest of Sturgeon Heights and in the northwest corner of the study area. Much of the land to be developed for agricultural purposes in the sub-region is expected to lie in the general Valleyview area.

Development elsewhere is constrained by the forestry zone. The rights to large areas of forestry lands in the southwest corner of the study region and north of Sturgeon Lake are held by logging companies and it is likely that those lands are effectively frozen in terms of future agricultural

development. Similarly, much of the potentially arable land in the southeast corner of the sub-region is in the 'green area' and is unlikely to be removed for agricultural development.

Counterbalancing the continued growth in agricultural land use, which generally will occur in more marginal areas, will be an ongoing trend toward farm consolidation. Economic factors such as the high costs of land, fuel, fertilizer, and machinery; the variable production and marketing conditions; and the high wages in alternative forms of employment are likely to maintain the land consolidation process. In addition, to the extent that marginal lands are developed for agriculture, this will probably necessitate increasingly large average farm sizes to support a viable operation. The study team was informed during the course of its investigations that as many as 75 quarter sections of lands are to be disposed of by large corporate landowners in M.D. 130. It is unclear at this time what effect this may have in terms of farm employment and the number of new farm units, but it may have a short-term effect on sub-regional farm consolidation patterns.

The recent report on grain transportation and handling cited earlier provides reasonably optimistic projections regarding the amount of lands that may be developed in the region to 1990. These projections convert to more than 16,200 hectares per year of new farmland. By comparison, based on Canada Census figures, it is estimated that in the order of 20,600 hectares per year of new farmland were brought annually into farm use between 1966 and 1976 (see Table 11). However these figures obscure the fact that the pace of new land development slowed considerably in the latter half of the period 1966 to 1976; new land was brought into production at a 5.2% annual rate of growth during the period 1966 to 1971, whereas this rate was halved to 2.6% for the period 1971 to 1976.

Table 11. Agricultural areas farmed and improved. East Peace Sub-Region, Census Division 15, and Alberta. 1966 to 1976.

	1966	1971	1976	Average Annual Rate of Change 1966-76
		(000 acres)		
EASTERN PEACE[a]				
Total Area Farmed (estimated)	1 109	1 426	1 619	3.9%
Total Improved Land (estimated)	676	859	968	3.7%
CENSUS DIVISION 15				
Total Area Farmed	5 050	5 886	6 266	2.2%
Total Improved Land	3 043	3 641	3 948	2.6%
ALBERTA				
Total Area Farmed	48 983	49 606	49 520	0.1%
Total Improved Land	27 276	28 460	29 137	0.7%

a The boundaries of the study area do not coincide with those for which published agricultural statistics are available. Based on an examination of maps of I.D. 16 and 17, 60% of the farmland attributed to I.D. 17 has been allocated to the East Peace sub-region. Approximately 60,000 acres or 9.7% of total farmland in I.D. 16 lies outside the sub-region boundaries but are included in these figures.

Source: Statistics Canada. Census of Agriculture. 1966, 1971, 1976, and estimates by Peter C. Nichols & Associates Ltd.

On the basis of discussions with lands disposition and agricultural officials, it is expected that an additional 80,000 hectares of land may be developed for agricultural use by 1995; or somewhat more than 5000 hectares annually.

In terms of net employment and population impact, however, it must be recognized that farm consolidaton trends can be expected to continue and will offset the increase in farm population prompted by new development. It has been assumed in this report that a 1.5% annual consolidation rate will apply to existing farm units as compared to the 1.9% rate which has been experienced province-wide in recent years. The lower rate can probably be expected in the East Peace because some areas in the sub-region are not yet mature and offer some potential to expand operations by either acquiring new lands or cultivating existing farm lands which are as yet unbroken.

Development scenarios have been formulated for the East Peace, based on the range of farmland expansion that may be expected over the study period. These scenarios are summarized in Table 12.

Under the "probable" case, it is estimated that the number of farm units in the sub-region will decline by 208 during the period 1980 to 1995; taking into account probable changes that occurred since 1976, this would mean that by 1995 the number of farm units would be lower than 1976 levels by 10%.

6.5.5 Forestry

6.5.5.1 Background. The East Peace sub-region comprises parts of the Slave Lake, Grande Prairie and Peace River Forests and accounts for between 3% and 5% of Alberta's estimated allowable cut of deciduous and coniferous reserves.

Table 12. Agricultural development scenarios, East Peace sub-region, 1980 to 1995.

SCENARIO		CUMULATIVE DEVELOPMENT OF FARM UNITS 1980-1985	1985-1990	1990-1995
LOW	- Development @ 4,000 hectares (10,000 acres) per year[a]	50	100	150
	- Less: Effect of consolidation[b]	(143)	(279)	(403)
	- Net change in farm units	(93)	(179)	(253)
PROBABLE	- Development @ 5,200 hectares (13,000 acres) per year[a]	65	130	195
	- Less: Effect of consolidation[b]	(143)	(279)	(403)
	- Net change in farm units	(78)	(149)	(208)
HIGH	- Development @ 6,400 hectares (16,000 acres) per year[a]	80	160	240
	- Less: Effect of consolidation[b]	(143)	(279)	(403)
	- Net change in farm units	(63)	(119)	(163)

a Assumes 400 hectares (1000 acres) per farm unit.

b Based on 1.5% decline per year in the base number of farm units.

Source: Peter C. Nichols & Associates Ltd.

Annual timber production from the sub-region itself is estimated to be about 34 million board feet (MM FBM) equivalent. The estimated surplus allowable cut is roughly 25 MM FBM of coniferous and 75 MM FBM of deciduous species. However, the relatively small size of the sub-region and the fact that its boundaries do not coincide with realistic forestry catchment areas reduce the meaningfulness of such figures. Present and proposed forestry developments of real significance overlap sub-regional boundaries and must be considered in the context of available reserves beyond the study area itself.

The southwest part of the sub-region includes reserves held by Procter and Gamble and North Canadian Forest Industries; logging operations are carried out in conjunction with those firms' production facilities in Grande Prairie and much of the economic impact, except possibly for some seasonal woodlands employment accruing to rural residents within the sub-region, is concentrated outside the East Peace.

Areas within the sub-region south and north of Slave Lake are generally logged by operations centred in the High Prairie area, while reserves on the extreme western part of the East Peace are handled by operations out of the Slave Lake vicinity.

As a result then, of quota affiliations and other locational considerations, the economic impact of the forestry industry to the study area is centred around High Prairie and north to the Utikuma area.

The largest forest products operation in the East Peace is Buchanan Lumber Ltd., which has a sawmill and planing mill in High Prairie. Lumber production totals about 25 MM FBM of timber annually; in addition, 20,000 bone dry units of wood chips, equal to approximately 33 MM FBM are shipped to Procter

and Gamble in Grande Prairie. The firm provides about 100 full-time equivalent (FTE) positions, including woodlands employment (Ondro, W.J., B.W. Karaim, R.A. Bohning, and G.R. Stevenson, 1980). Three smaller mills -- two at Enilda and one near Gift lake -- produce another 34 MM FBM annually and provide roughly 180 FTE jobs. Many small mills are also spread throughout the sub-region and these produce in the order of 11 MM FBM annually and about 80 jobs.

6.5.5.2 Development potential. No significant changes in the East Peace forestry industry can be foreseen at this time. Much of the forestry area in the immediate region is presently committed and offers limited potential for new development. Forestry areas in the western part of the sub-region are generally tied to Grande Prairie operations, while those in the northeast area will more probably be served from the Slave Lake vicinity. Some forestry reserves south of Lesser Slave Lake offer potential for enhanced development but the impact is likely to be shared with, or centred at, Swan Hills or Kinuso.

Discussions with the larger sawmill operations in the High Prairie area suggest that little expansion in the industry is likely and that increases in one operation may be offset by decreases in another. For example, the Buchanan mill at High Prairie is considering moving to a two-shift basis and expanding output by about 9 MM FBM annually by exercising its option for some forest reserves. This would add about 40 men to its operation. However, Nelson Lumber, which produces about 9 MM FBM annually from its Gift Lake mill, anticipates that its operation may have to close because of declining timber reserves on the nearby Metis Settlement, from which it purchases much of its wood supply. The effect of these two changes would be largely counter-balancing in terms of sub-regional employment.

Increased logging of aspen wood that is proposed east of Utikuma Lake, in association with the reopening of existing forest products facilities on Slave Lake (Wildwood of Canada Ltd.) may serve to increase seasonal employment opportunities for native people in the region over the next several years.

It is possible that over time some consolidation of mill operations could occur and, indeed, the net effect of this trend to a larger and more economic scale might be to reduce employment.

The main timber development areas in the Province designated by the Alberta Forest Service generally lie outside of the East Peace region, although the Utikuma Lake area encompasses a part of the Peace River Timber Development Area. These development areas have been defined on the basis of a number of criteria, including the availability of timber resources, which must be able to support "a significant capital facility, capable of utilizing small-diameter coniferous timber" (Alberta Forest Service 1979). Over the long-term, beyond 1990, it is possible that a thermal-mechanical pulp mill may be constructed to utilize timber in the southern part of the Peace River Timber Development Area and, according to the Alberta Forest Service, a likely location for such a plant would be in the Utikuma Lake area of the sub-region.

6.5.5.3 Development scenarios. Recognizing the various factors and uncertainties that may affect the development of the forestry industry in the sub-region, "low", "probable", and "high" scenarios have been defined for the period to 1995. These are summarized in Table 13. Under the low scenario, some decreases in activity and employment may result from wood supply problems and operational consolidation. Under the probable case, activity remains virtually stable, although increased logging north of Slave Lake provides additional

Table 13. Forest industry development scenario, East Peace sub-region, 1980 to 1995.

SCENARIO	STUDY PERIOD		
	1980 to 1985	1985 to 1990	1990 to 1995
LOW	Reduced activity at some mills due to supply problems; consolidation of mills.	Reduced activity at some mills due to supply problems; consolidation of mills.	Reduced activity at some mills due to supply problems; consolidation of mills.
PROBABLE	Stable activity with declines in some mill operations off-set by increases elsewhere.	Some expansion of logging activity east of Utikuma Lake area related to Slave Lake operations.	--
HIGH	As in Probable Case.	As in Probable Case.	As in Probable Case. Development of thermal-mechanical pulp mill in Utikuma area.

Source: Peter C. Nichols & Associates Ltd.

seasonal logging opportunities for native people in the sub-region. Under the "high" case, a thermal-mechanical plant is built in the Utikuma area, using reserves from the southern part of the Peace River Timber Development Area, which is largely located in the North Peace sub-region.

6.5.5.4 Employment impact. The estimated employment impact to the sub-region of the various development scenarios is summarized in Table 14. Employment is expressed both in terms of the absolute number of positions created and full-time equivalent (FTE) jobs. The seasonality of much work in the industry is important, and quite compatible with agricultural activities which permits farmers to accept off-farm work during the winter months.

Under the "probable" case, it is estimated that only about 20 new FTE positions will be made available by the forestry industry by 1990. This represents only about a 5% increase in existing industry employment levels.

6.5.6 Oil and Gas Industry

6.5.6.1 History of development. The East Peace sub-region lies within a sedimentary basin which extends from offshore Louisiana in the south to the Beaufort Sea in the north and which encompasses Alberta's petroleum resources. Indications of petroleum in the Province of Alberta have been in evidence for many years. The McMurray tar sands oil accumulation was noted in outcrops by Peter Pond in 1788. The next discovery of hydrocarbons occurred in 1890 at Medicine Hat, where gas was discovered while drilling for coal. The first commercial production was from a gas well completed in 1903 at Medicine Hat.

Table 14. Employment impact of forestry developments, East Peace sub-region, 1980 to 1995.

SCENARIO		CUMULATIVE INCREMENTAL POSITIONS		
		1985	1990	1995
LOW	- Full-time	(25)	(30)	(35)
	- Seasonal	(60)	(70)	(80)
	- Full-time Equivalent[a]	(50)	(60)	(70)
PROBABLE	- Full-time	--	--	--
	- Seasonal	--	50	50
	- Full-time Equivalent[a]	--	20	20
HIGH	- Full-time	--	--	160
	- Seasonal	--	50	340
	- Full-time Equivalent[a]	--	20	300

[a] A seasonal job is assumed to equal 0.4 FTE positions.

Source: Estimates by Peter C. Nichols & Associates Ltd.

The northern part of Alberta did receive some early exploratory attention. A well was drilled at Athabasca Landing in 1895 but was not successful. This was followed by drilling further downstream on the Athabasca River where gas was discovered in 1897 and burned uncontrolled for more than 20 years.

A more intense interest in exploration occurred after the discovery of gas with large quantities of natural gas liquids in Turner Valley in 1916, and of oil at Norman Wells in the Northwest Territories in 1920. However, because of access problems and the lack of knowledge about the geology of the area, limited drilling occurred in the East Peace until after the discovery of the Leduc oil field in 1947 and the Redwater oil field in 1948.

The rather small Normandville field was discovered in the Girouxville area in 1949 and this was followed by the discovery of the Sturgeon Lake and Sturgeon Lake South oil fields near Valleyview. The latter two fields are among the larger and more prolific fields in Alberta. The oil fields were connected by the Peace Pipe Line system, and the Alberta Gas Trunk Lines system was extended to the Sturgeon Lake area in 1969.

Few oil or gas discoveries have been made in the sub-region over the past decade. The East Peace, despite being relatively small in area, has average geological potential for additional discoveries.

Table 15 provides information on developed reserves in the East Peace sub-region. The sub-region covers about 2.9% of Alberta's sedimentary basin and, at the end of 1978, accounted for 0.6% of provincial gas reserves and 6.0% of remaining oil reserves.

Table 15. Petroleum resources, Alberta and East Peace sub-region, 1978.[a]

	ALBERTA	EAST PEACE SUB-REGION	EAST PEACE AS PERCENTAGE OF ALBERTA
Area of Sedimentary Basin, million hectares	61.7	1.8	2.9
Natural Gas			
Initial established reserves (10^9m^3)	2,431	12.5	.5
Remaining established reserves (10^9m^3)	1,665	10.3	.6
Remaining reserves as % of initial reserves	68.4	82.4	--
Crude Oil			
Initial established reserves (10^6m^3)	1,856	103.9	5.6
Remaining established reserves (10^6m^3)	795	47.7	6.0
Remaining reserves as % of initial reserves	42.8	45.9	--

[a] As at year end.

Source: Energy Resources Conservation Board. Report on reserves of crude oil, natural gas, natural gas liquids and sulphur. December 31, 1978, and estimates by Boykiw & Company Ltd.

A more detailed picture of existing crude oil and gas reserves in the sub-region is provided in Table 16. On the basis of current levels of production, the oil fields have an estimated 13 years of economic life remaining; the gas fields, 50 years. However, these figures presume current rates of production: it can be expected that the oil fields will produce over many years at declining rates of output. The economic life of the gas fields will be dependent to a considerable extent on marketability, which is now a constraint to output. In any event, it is clear that the existing fields in the sub-region will be producing beyond the study horizon year of 1995.

6.5.6.2 Industry status. The focus of oil and gas activity in the East Peace is centred in the Valleyview area and the Utikuma and Nipisi areas north of Lesser Slave Lake. The latter area is largely served from the Town of Slave Lake, which is outside the sub-region.

The industry's exploration activities do not provide significant opportunities for stable, long-term employment. The sub-region competes for exploration funds with virtually the rest of the world and the level of activity can fluctuate markedly with prospects in and outside the area. Exploration work is concentrated in the winter months, when equipment can be transported over the frozen ground, and is therefore quite seasonal. Crews for geophysical work are normally assembled in Calgary or Edmonton, in order to ensure that operations can commence as soon as equipment is on-site. Local residents are often hired for various non-technical jobs, such as line clearing and trucking, particularly if the operations continue for any period of time.

The geophysical crews are followed by the drilling crews, who again move in and out on a short-term basis and are generally accommodated in temporary camp facilities.

Table 16. Crude oil and natural gas reserves by field, East Peace sub-region (as at year end 1978).

	FIELD NAME	DISCOVERY YEAR	INITIAL RESERVES 10^6m^3	REMAINING RESERVES 10^6m^3
A. CRUDE OIL	Ante Creek	1963	3 978	2 580
	Little Smoky	1954	199	39
	Nipisi	1965	56 024	25 610
	Normandville	1949	600	153
	Snipe Lake	1962	12 400	6 118
	Sturgeon Lake	1952	3 530	920
	Sturgeon Lake South	1953	26 110	11 510
	Sunset	1960	1 066	734
Total Crude Oil			103 907	47 664
B. NATURAL GAS	Ante Creek	1963	1 553	1 276
	Ante Creek North	1954-71	682	679
	Gilwood	1956	939	933
	Heart River	1952-	649	552
	Karr	1968-76	1 502	1 502
	Kimiwan		133	133
	Nipisi	1965	1 128	856
	Normandville		1 280	981
	Roxanna	1974	485	485
	Sturgeon Lake (Assoc.)		273	273
	Sturgeon Lake South (Assoc.)	1953	3 866	2 586
Total Natural Gas			12 490	10 256

Source: Energy Resources Conservation Board. Report on reserves of crude oil, natural gas, natural gas liquids and sulphur. December 31, 1978.

Permanent employment opportunities in the industry are provided when oil or gas is discovered and production operations commence. Valleyview and its surrounding area domicile most of the permanent industry employees living in the sub-region.

A telephone survey was carried out during the course of the study in which most oil and gas companies and service firms in the sub-region were contacted. On the basis of the survey, which is summarized in Table 17, it is estimated that oil industry employment (excluding geophysical and drilling activities) in the East Peace totals about 260, about one-tenth of this is accounted for by residents outside the study area.

Table 17. Summary of estimated oil industry employment, East Peace sub-region.[a]

SOURCE OF EMPLOYMENT	NON-RESIDENT EMPLOYEES	RESIDENT EMPLOYEES		TOTAL EMPLOYEES[b]
		Working Inside Study Area	Working Outside Study Area	
Oil and Gas Companies	33	92	21	146
Service Companies	--	70	-	70
Gas Pipelines	--	12	-	12
Oil Pipelines	--	35	--	35
TOTAL	33	209	21	263

a Excludes geophysical and drilling activity.

b Excludes employees resident in Slave Lake working in north-eastern part of sub-region.

Source: Boykiw & Company Ltd.

6.5.6.3 Geological prospects. The future development of the oil and gas industry in the East Peace sub-region will be dependent on energy marketing and pricing considerations, discussed in a later section, and on the local geological base. The thickness and type of sediments in the sub-region will determine the extent of exploratory interest and the potential for oil and gas discoveries.

The thickness of the sedimentary section in the East Peace sub-region ranges from 1,800 meters in the northeast to 3,500 meters in the southwest. A description of the various geologic sections, from the oldest to the youngest sediments, follows.

The Cambrian and Ordovician age sections are nonexistent over much of the sub-region, but, in any case, these sediments are generally nonproductive in Alberta

The Devonian age sedimentary unit, which contains about 62% of Alberta's oil reserves and 35% of Alberta's gas reserves, averages 1,200 meters in thickness over the sub-region. The Upper Devonian section in particular has a large number of oil fields across Alberta. Within the sub-region, the Nipisi and Snipe Lake fields produce from the Lower Devonian and Sturgeon Lake from the Middle Devonian section. Discovery of some additional Devonian age reservoirs in the future is quite probable.

A new geologic concept in oil development involving "in situ" recovery of heavy oil from Devonian carbonates has received publicity recently. Experiments are taking place outside of the region but carbonate-type rocks also occur in East Peace and the establishment of commercial feasibility could result in some substantial developments. However, no provision has been made in the study projections for the exploitation of

carbonate heavy oil deposits because of uncertainties regarding commercial viability and the location of potential developments.

The Carboniferous sediments range up to 500 meters in thickness in the western part of the sub-region and may provide some oil or gas discoveries in the future.

The Permian, Triassic and Jurassic sections are very thin over most of the sub-region. These geologic horizons have not been highly productive across the Province and are unlikely to be the source of additional hydrocarbons discoveries in the sub-region.

The Lower Cretaceous section, consisting of layers of sands and shales, ranges in thickness from 300 to 600 meters in the sub-region. To date, these zones have not provided any significant oil or gas discoveries. However, this geologic section is the productive horizon of what is referred to as the Deep Basin or Elmworth gas play. The eastern boundary of the Deep Basin is not a precisely defined boundary and may extend into the southwestern part of the sub-region. Because of the prolific nature of the Deep Basin play, some gas and possibly oil discoveries will be made in the southwestern area of the sub-region.

The Upper Cretaceous, present over part of the sub-region, is not considered to be a very good prospect for additional gas or oil reserves.

The East Peace sub-region is considered to have average exploration potential, given the types and nature of the sediments underlying the area. A study of ultimate gas reserves in Alberta, submitted by C.R. Winters to the Energy Resources Conservation Board (ERCB), concluded that on the basis of drilling experience and geology, only 45% of the gas

reserves in the northwestern part of Alberta, which follows the general boundaries of the Lower Peace, North Peace and East Peace sub-regions, have not yet been discovered. This compares to 84% yet to be discovered in the general Grande Prairie area. The lowest percentage still to be discovered was 31%, in the heavily-drilled central part of Alberta.

In view of the probable gas still remaining to be discovered, additional exploration and development can be expected to take place, and particularly in the Deep Basin area, providing good marketing and pricing prospects exist.

6.5.6.4 Development factors. Oil industry activity in the East Peace will be largely dependent on the overall level of exploration and development in the Province as a whole. This, in turn, will be affected by a number of factors, of which developments in the natural gas sector will be particularly important.

Over the past few years, the growth in Alberta natural gas sales has slowed considerably, from 11% annually during the period 1967 to 1974, to only 2.4% per year over the past five years. Significant growth in the future will depend on the development of new and major markets for natural gas. Canada imports about 80,000 cubic metres (500,000 barrels) daily of crude oil and there are ready markets for any oil discovered in the sub-region. The main barrier to possible developments is that newly discovered oil pools may be too small to justify oil pipelines or transportation by truck.

During the past five years, the level of activity in the oil industry has been very high, because of enhanced industry cash flow and the expectation that shut-in reserves could be put on stream in the near future. If additional gas markets are not developed, it is anticipated that a very large decline

in activity could materialize, with the volume of drilling declining by as much as one-third or one-half of recent levels (Boykiw & Company Ltd. 1979). At the present time, various economic and regulatory forces are in conflict, and proposed gas export schemes are encountering delays: these factors will have an important bearing on the future development of the oil and gas industry.

The construction of new pipeline systems and the development of new markets would enhance the sales prospects for western Canadian gas reserves, including those in the sub-region, and encourage a continued high level of exploration and development activity. The so-called "pre-build" gas pipeline system is proposed for construction during 1980 (western portion) and 1981 (eastern portion). This system is to form the first phase of an ultimate gas pipeline from Alaska. Upon completion of the "pre-build" and after a lapse of about one year, it is planned that construction of the line to Alaska be carried out during the period 1983 to 1985. The Canadian Government has approved construction of the pre-build but has not secured substantial guarantees regarding the completion of the entire Alaska gas pipeline project.

The average export sales proposed for delivery though the "pre-build" amount to about 30 million cubic metres daily, or about 15% of average deliveries of Canadian natural gas in 1979. The National Energy Board has also authorized the further export of 8 million cubic meters daily via the Trans-Canada Pipelines system. Applications are pending before the ERCB to increase the approved gas removal from Alberta in order to extend the period of exports through the "pre-build" (present export permits terminate in 1987 or 1988) and to provide gas to the new eastern Canadian markets.

The U.S. Federal Energy Regulatory Commission (FERC) has not yet granted approval to the importation by U.S. companies of all the additional gas volumes authorized for export by the Canadian Government. Reacting primarily to rapid increases in Canadian gas export prices, FERC has initiated proceedings to examine means of preventing an excessive U.S. dependence on Canadian gas; it is also proposing the examination of "take or pay" contracts under which payments are made to producers for minimum volumes whether they are taken or not. Changes in the existing gas contract policies to disallow this could adversely affect the industry.

A further consideration that will have an impact on industry prospects relates to the fact that field prices of natural gas in U.S. are gradually being de-controlled and a short-term surplus of supply has developed, although reserves continue to be drawn down. The continued drawdown of reserves points to good prospects for Canadian gas over the long term but the short-term surplus can lead to the U.S. Government agencies moving very lethargically in providing the necessary approvals for the marketing of significant new quantities of Canadian gas in the United States.

The National Energy Board has recommended, with federal government concurrence, that the Canadian gas pipeline system be extended from Montreal to Quebec City and the Eastern Townships, with the transmission lines constructed during 1981 and 1982. A further extension of the line to the remainder of Quebec and the Maritimes has not been approved, pending receipt of additional information regarding eastern Canada offshore oil and gas resources. However, it is estimated that by 1995, the additional sales in the two new market areas would be equivalent to only 3.5% and 6%, respectively, of 1979 Canadian natural gas sales.

6.5.6.5 Development scenarios. The previous discussions regarding geologic prospects and extra-regional basis for formulating scenarios of future development in the sub-region. These scenarios are summarized below.

	Natural Gas Development	Crude Oil Development
LOW CASE	Delays affect portions of pre-build system. Modest increases in gas sales to U.S. Gas pipeline not extended to Maritimes.	No new oil fields are discovered. Additions to employment occur after 1985 as wells mature and require more workovers and water disposal.
PROBABLE CASE	Pre-build system proceeds. Export permits extended but volumes not increased. Alaska gas pipeline meets additional U.S. requirements. Gas pipeline not extended to Maritimes.	As for Low Case but one or two additional small fields are discovered after 1985.
HIGH CASE	Construction of gas pipeline from Alaska is cancelled or delayed, due to financing difficulties or increased availability of gas from the lower 48 States and Canada. This enhances the prospects for natural gas marketing and development in Alberta, including the sub-region. Export volumes are periodically increased over present application volumes. Gas pipeline extended to Maritimes. Additions to proposed gas plant capacities after 1985.	A significant oil play is discovered before 1990 and tertiary recovery becomes economical in the early 1990's at existing oil fields.

6.5.6.6 Development implications on geophysical activity. Geophysical activity has relatively little impact on permanent employment in the sub-region. Geophysical contractors normally assemble their crews from their operating bases in Calgary or

Edmonton; a crew generally comprises from 25 to 40 people. In addition, about nine persons are required for construction and bush clearing work and this employment is often contracted out. Once the operation is established, local people are substituted as they become available and openings occur, particularly for relief purposes. Employment in the sub-region is usually terminated when the seismic work is completed.

The number of active geophysical crews operating in Alberta averaged 43 in 1979, down from 63 in 1978. The number reaches a low point in March to May, during spring break-up. The 1979 decline in geophysical activity is significant because it may presage a slowdown in exploratory and development activity. The cutback is considered a function of the industry outlook and the prospects for marketing new gas reserves.

A province-wide average of 45 crews operating is used in this study as a basis for sub-regional projections. Based on earlier discussions regarding petroleum resources in the East Peace and its geological prospects, it is estimated that in the order of 3% of geophysical activity in the Province can be expected to occur in the sub-region, or an average of one crew on an on-going basis. Under the "probable case", this might increase to two crews by 1985, before declining again as the most promising geological prospects are explored. The number of geophysical crews projected for the sub-region under the various scenarios shown in Table 18 below.

Table 18. Projected geophysical activity, East Peace sub-region.

	1980	1985	1990	1995
LOW SCENARIO - # crews	1	0.5	0.5	0.5
PROBABLE SCENARIO - # crews	1	2	1	1
HIGH SCENARIO - # crews	1	2	2	2

Source: Boykiw & Company Ltd.

6.5.6.7 Development implications on drilling activity. The number of staff required to operate a drilling rig averages about 17; these personnel generally operate from camps and this is unlikely to change. Therefore, except for the support services that are established for servicing drilling operations (rig moving, casing, cementing, well logging, perforating, acidizing, etc.), the drilling operations are not expected to provide any significant employment in the sub-region.

Drilling in the East Peace will be closely related to activity in the Province as a whole, which as earlier indicated, will be largely determined by natural gas marketability. There were an average of 230 and 278 rigs operating in Alberta in 1978 and 1979, respectively. Data developed for the sub-region indicate that 77 wells were completed during 1978. Using an average drilling time of 17 days per well, it is estimated that an average of 3.5 rigs were operating on a continuous basis; this is equal to 1.5% of the Alberta total. On the basis of provincial data, it can be assumed that one-half of the rigs are carrying out exploratory drilling, the balance are devoted to field extensions and development work. Drilling activity in 1980 is higher than in 1978 and 1979, but more of the emphasis has shifted to the area south of Grande Prairie. Accordingly, it is estimated that an average of 4 rigs will be in the East Peace during 1980, either drilling or in the process of moving.

Approximately one-half of the gas well production capacity in the East Peace necessary for the "probable case" is presently in place. To accommodate the available market, approximately 60 development wells would be drilled during the next four years; this represents work for one more rig on a continuous basis. With exploration drilling increased slightly, about 6 rigs would be operating 1985 in the "probable" and

"high" cases; this should lead to about a 30% increase in the permanent employment of service company personnel.

Under the "low case", drilling activity will decline drastically by 1985. The failure to proceed with the "pre-build" system will cause drilling levels to fall, rig movements to the U.S. to accelerate, and employment in support services to decline.

Under the "probable" and "high" cases drilling activity will decline more slowly, as exploration of the sedimentary basin is completed.

Shown below is the projected number of drilling rigs operating in the East Peace under the different scenarios.

	1980	1985	1990	1995
LOW SCENARIO	4	1	--	--
PROBABLE SCENARIO	4	6	3	3
HIGH SCENARIO	4	6	4	3

6.5.6.8 Development implications on oil production. The oil fields in the East Peace have an estimated reserve life, at 1978 production rates, of about 13 years, but with production likely to taper off in the later years, it is unlikely that any of the pools will be depleted over the study period. As pools reach the end of their productive life, greater manpower resources are required and a growth rate of 3% annually in employment requirements has been applied after 1985 under the "low" and "probable" cases. A 4% annual growth rate is attributed to the "high" case, in which tertiary recovery techniques are used to enhance oil production.

The possibility of additional oil fields being discovered in the East Peace has been mentioned earlier. Speculative estimates of the related manpower requirements have been developed and range up to 35 new jobs in 1995 under the "high" case.

The employment projections are summarized in Table 19.

6.5.6.9 Development implications on gas production. Approximately 82% of the discovered gas reserves of the sub-region remain to be produced. Information has been obtained from Pan-Alberta Gas regarding new contracts that have signed for fields in the sub-region. On the basis of that information, which is not necessarily exhaustive, it is estimated that gas plant capacity will increase by more than 100% by 1984 or by approximately 484 million cubic meters per year. The existing capacity in the region totals 461 million cubic meters. The location of the gas fields provides a general guidance as to the probable location of plant additions. It is also likely that producers will construct jointly-owned plants serving a number of the fields. Plant construction will require about 45 man-years between 1980 and 1985, which would be augmented by employment in road and site preparation.

Sulphur, a by-product of natural gas, is presently trucked from Valleyview to Fox Creek, with one trucker moving sulphur at about the same rate that it is produced. Because of present high sulpur prices, three more truckers will be employed for two to three years to reduce the stockpile.

The estimated changes in employment under the various development scenarios are summarized in Table 19.

Table 19. Changes in permanent employment in the oil and gas industry, East Peace sub-region, 1980 to 1995.

	SCENARIO	1980	1985	1990	1995
OIL AND GAS PRODUCTION					
Existing oil fields	Low	--	--	3%/year	3%/year
	Probable	--	--	3%/year	3%/year
	High	--	3%/year	4%/year	4%/year
New oil fields	Low	--	--	3 jobs	5 jobs
	Probable	--	2 jobs	12 jobs	25 jobs
	High	--	4 jobs	25 jobs	35 jobs
Gas fields/ plants	Low	--	2%/year	2%/year	1%/year
	Probable	--	12%/year	2%/year	2%/year
	High	--	12%/year	7%/year	5%/year
SUB-TOTAL[a]	Low	195	220	235	270
	Probable	195	230	275	340
	High	195	255	350	465
PIPELINES					
Oil pipelines	Low	35	37	37	37
	Probable	35	45	50	50
	High	35	47	55	55
Gas pipelines	Low	12	15	17	17
	Probable	12	18	22	25
	High	12	20	25	30
TOTAL EMPLOYMENT	Low	242	252	289	324
	Probable	242	293	347	415
	High	242	322	430	550

[a] Percentage increases relate to annual increases over previous benchmark year.

Source: Boykiw & Company Ltd.

6.5.6.10 Development implications on oil pipelines. Applications have been made to carry crude oil and natural gas liquids in a new pipeline to be constructed from the area immediately north of Grande Prairie farther to the south. Preliminary approval has been given to the Peace Pipe Line proposal, which would connect with the Simonette terminal (near Valleyview) of the main Peace Pipe Line system. Approximately 12 new employees would be required.

6.5.6.11 Development implications on gas pipelines. NOVA (formerly AGTL) operates the main gas transmission line in the East Peace and discussions with NOVA officials have provided a basis for the employment projections in Table 19.

6.5.7 Manufacturing

The manufacturing sector in the East Peace is quite undeveloped except as it relates to the processing of forestry resources, which has been discussed under an earlier heading.

The most recent listing of Alberta manufacturing establishments that is available (Department of Economic Development, Index of Manufacturers in Alberta, 1979-80) identifies nine manufacturers in the sub-region. These primarily include bakery, publishing, and metal fabrication firms which are directed to the local or regional markets. Not included on the list is a wood products operation which produces pallets, located in the East Prairie Metis Settlement. As well, a concrete block plant is now located in McLennan which employs 20 people.

Two agricultural-based processing operations are based in Falher. These are feed manufacturers and a substantial share of their output is destined for export or extra-regional markets.

It is unlikely that any major manufacturing base will develop in the sub-region in the foreseeable future, although opportunities exist for expansion of resource-based processing, particularly in the agriculture and wood products fields, and for the development of manufacturing operations geared to local market requirements. The substitution of locally-produced goods for products now derived from outside the region may occur in some sectors. Under an optimistic development scenario, it is estimated that 50 new basic manufacturing jobs may be generated in the sub-region within each of the five-year periods to 1995.

Reference should be made to discussions currently underway regarding the possible construction of a modular buildings and fibre pipe manufacturing plant in the vicinity east of High Prairie. The plant would initially employ about 40 persons, rising to possibly 150 persons in later stages. The project is considered speculative at this time and no provision has been made in the employment projections for its development, but it is clear that the project would have a positive impact on the growth of High Prairie.

6.5.8 Retail and Service Trade

The retail and service industry in the East Peace sub-region is concentrated in the communities of High Prairie, Valleyview, and Falher, which together account for about 85% of total trade activity. Relevant statistical figures for 1977 are given in Table 20. The three communities cited have large trade areas relative to their own sizes, as evidenced by the high level of receipts per capita.

Although estimates of this kind are subject to statistical errors and discrepancies, an analysis of trade activity indicates that per capita retail and service spending

Table 20. Retail and service trade activity, Alberta, Census Division 15, and East Peace sub-region, 1977.[a]

	RECEIPTS ($000)	RECEIPTS CAPITA ($)	OUTLETS	OUTLETS/ 1000 POPULATION
ALBERTA	9 879 798	5 212	19 582	10.3
CENSUS DIVISION 15	430 516	4 034	1 189	11.1
EAST PEACE SUB-REGION:[b]				
M.D. 130 Area				
Falher	10 491	9 367	33	29.5
McLennan	2 464	2 175	10	8.8
Girouxville	1 850	6 106	8	26.4
Donnelly	1 169	4 205	6	21.6
Remainder of area	849	n/a	6	n/a
I.D. 16 Area				
Valleyview	16 073	9 367	54	31.5
Debolt	1 206	n/a	6	n/a
I.D. 17 Area				
High Prairie	23 600	10 346	64	28.1
Atikameg	1 097	n/a	3	n/a
TOTAL SUB-REGION[c]	58 799	3 210	190	10.4

a Adapted from tables in Alberta Bureau of Statistics. Retail and service trade statistics. 1977.

b Populations for East Peace based on 1976 Canada Census figures and include Indian Reserves.

c Excludes unincorporated centres other than those shown, in I.D. 16 and I.D. 17.

within the sub-region is about 60% of average provincial levels. An important reason for this can be attributed to lower income levels in the East Peace and, adjusting for this factor, it is estimated that sub-regional trade activity is approximately 80% of what would be expected if expenditures by residents were confined to the region, and the effects of inter-regional trade flows are netted out. The corollary of this conclusion is that a significant portion of potential trade activity -- perhaps 20% -- accrues to other areas of the Peace River region and the Province. The City of Grande Prairie and the Town of Peace River are the dominant high-order centres in the Peace River region and serve as important extra-regional service magnets to the sub-region.

An analysis of 1971 and 1979 telephone books covering the sub-region has been undertaken to provide a measure of the changes that are occurring within the business sector.

Businesses in each community were classified according to the Standard Industrial Classification (SIC) code. Although the absolute numbers derived through the data collection and analysis process are subject to errors, because of the form of the raw data and the manual tabulation required, the information does provide a guide to the magnitude, distribution, and nature of change that has occurred within the commercial sector.

The number of businesses in the East Peace increased by 150, or by 55% during the eight-year period to 1979. The towns of Valleyview, Falher, and High Prairie accounted for 85% of the overall increase in businesses. In relative terms, the Village of Donnelly experienced a more than doubling of its number of listed businesses, from four to eleven. The remaining increase in listings was distributed among the smaller centres in the study area.

With the exception of Valleyview, the majority of the growth was in the retail trade, services, and construction categories. For Valleyview, approximately one-half of the growth was related to primary and construction industries; a further 15% was accounted for by automotive service stations. This reflects Valleyview's increasing importance as an oil and gas service centre and transportation hub.

To the extent that population and incomes levels rise in the sub-region over time, the retail and service industry will likely expand to accommodate the increased demands. The availability of highway commercial services will also increase in relation to the higher flows of traffic through the sub-region, which is an important highway portal to the north. However, the development of the retail and service sector will be constrained somewhat by the limited potential for further resource expansion in the sub-region. The competition from high-order service centres outside the sub-region, and the relatively large number of communities serving the available trading market, limits the extent to which any of them can reach higher-order service thresholds.

6.5.9 Tourism

6.5.9.1 Background. The tourism sector is relatively unimportant to the East Peace economy at the present time. This reflects a lack of significant destination points in the area and the distance of the sub-region from major tourism areas and population centres in the more southerly parts of the Province. Earlier studies (Peace River Regional Planning Commission, 1974; Tourism Division, Alberta Business Development and Tourism, 1977) have indicated that the sub-region comprises only a small share of visitor destinations in the Province. Within the Peace River area generally, the Valleyview-Grande Prairie corridor has the highest levels of visitor activity;

this is followed by the North Peace area and, lastly, by the Lower Peace area.

It has been found that many visitors to the north-western part of Alberta pass through the area with other destinations in mind. Consequently, the amount of time spent in the region and the level of expenditures are relatively low. Furthermore, it appears that many of the remaining visitors come to the Peace River region, not to participate specifically in any particular activity but to visit friends and relatives or for general sightseeing purposes. This also helps explain the reason for the low average expenditures made by tourists (Peace River Regional Planning Commission, 1974).

The East Peace currently has 17 parks or campgrounds with a combined total of more than 600 camping sites. This includes four provincial parks: Hilliard's Bay Provincial Park which is located to the southeast of Grouard; Winagami Lake Provincial Park to the southeast of McLennan; and Williamson and Young's Point Provincial Parks which are located by Sturgeon Lake west of Valleyview.

Sports fishing is not a major source of attraction for non-residents to the sub-region; for example, a 1976 survey of persons fishing at Sturgeon Lake indicated that 75% were from the Peace River region, with the remainder from outside the region. Stream fishing is of minimal importance. Most angling takes place in the larger lakes such as Sturgeon, Lesser Slave, Windgami and Utikuma. Most lakes in the sub-region, with the possible exception of Sturgeon Lake, are considered to have potential for further sports fishing utilization. In terms of recreational hunting, the significance to the region appears to be greater. For example, 60 licensed guides are shown to have addresses in the East Peace (Alberta Energy and Natural Resources, Alberta Licensed Guides, 1979

Season) and management unit statistics also show hunting to be significant relative to the size of the local population. Information received from the Fish and Wildlife Division of Alberta Energy and Natural Resources indicates that slightly more than one-half of the moose hunters are from outside the region, while only about 30% of deer hunters are of non-local residence. The economic importance to the sub-region of recreational hunting and fishing activities is considered to be modest.

6.5.9.2 Outlook. The extent to which the tourist industry will develop in the East Peace will be constrained by the small number of tourist destination attractions and the limited user capacity of available recreation resources. Facilities and services for outdoor recreation are likely to emphasize an "extensive" rather than "intensive" form of use and will concentrate on accommodating the needs of the people of the Peace River region generally.

Nonetheless the sub-region acts as a conduit for traffic on the Alaska Highway, and less importantly, for traffic to Peace River and the Mackenzie Highway. Economic growth in Alaska, northeastern British Columbia, and the Grande Prairie area is likely to result in higher tourist traffic, particularly on the Little Smoky-Valleyview-Grande Prairie route. The main economic impact of the tourist traffic is likely to be in terms of automotive, food, and accommodation expenditures, with much of the activity concentrated in the summer months. This will assist to support highway commercial businesses in communities located on Highways No. 43 and 34.

The future economic impact to the sub-region of enhanced tourist flows is not likely to be significant, given the seasonality, limited range of goods and services expenditures involved, and the high level of "leakages" associated with

those expenditures (food and fuel expenditures, for example, will carry a high component of "imported" goods or purchases from outside the sub-region). The main economic implication is seen to be that of complementing the existing economic base and providing some limited form of diversification. The fact that tourist industry activity is concentrated in the summer months may help offset the seasonality associated with the oil and gas, and to a lesser extent forest industries, which are more active in the winter months.

6.5.10 Miscellaneous Industry Sectors

The preceding analyses of major industry sectors has provided a basis for estimating expected increases in basic employment in the region. However, it is evident that project opportunities and expansion in other unspecified sectors may also provide some contribution to basic employment. It is difficult to quantify the magnitude of such induced employment but provision has been made in the summary employment figures (Section 7) for five, ten, and fifteen new basic jobs per year to be generated under the low, probable, and high scenarios, respectively.

6.5.11 Conclusions

The preceding sections have examined the growth outlook of the sub-region in terms of various basic and non-basic sectors of the economy.

In general, the industry analyses have not identified significant opportunities for growth in the basic economic sectors. The agricultural industry will, by virtue of the consolidation trends that are underway, act to offset the moderate growth in employment anticipated in other sectors and to restrain sub-regional development.

The forestry industry will, under the most probable scenario, remain virtually stable but prospects for reduced timber reserves and operational consolidation could in fact cause the industry to decline in absolute importance. Some significant expansion, probably in the Utikuma Lake area, is possible under optimistic circumstances in the long-term and could have an important employment impact on the native people living nearby.

The oil and gas sector is likely to constitute the most important source of new basic employment to the sub-region and this should have the greatest impact on the Valleyview area.

Provision has also been made for growth in manufacturing and other unspecified basic industries. Development related to the resource base of the sub-region, including agricultural and wood products processing, appear to have particular potential.

Although the tertiary or service sector will continue to grow in response to higher incomes in the sub-region and increased highway commercial and tourist traffic, its development prospects will be constrained by the minimal growth expected in the basic industry sectors.

7. SUMMARY OF FUTURE GROWTH

7.1 SUB-REGIONAL EMPLOYMENT

7.1.1 Introduction

As explained in an earlier section, this study employs the export base approach or the basic to non-basic economic model to determine employment growth in the region and from that, population change. Having estimated what growth is expected in basic employment, a multiplier is applied to estimate total employment growth in the sub-region including indirect or non-basic jobs. The estimated number of new basic employment positions should normally be at least partially adjusted to reflect full-time equivalent jobs. This eliminates the possible double-counting that may arise if it is assumed that a new seasonal winter position in one industry and a new summer position in another necessarily require two employees. Having estimated the level of basic job creation, an appropriate employment multiplier must be developed to assess the overall impact on the local employment base.

7.1.2 Employment Multipliers

A considerable amount of literature has been written regarding employment multipliers and the estimation of these multipliers remains an inexact exercise. This is particularly the case insofar as sub-provincial areas and local communities are concerned. Estimates that have been prepared by other analysts in the past show a wide variation, even at the provincial level. In recognition of the lack of reliability and accuracy that can be expected in using a particular multiplier, the study team endorses the use of a range of multipliers which will allow planning authorities to anticipate the impacts of high and low estimates of changes in economic activity.

Employment multipliers for a locality are considered to be a function of a number of variables, but particularly important is the proportion of income spent locally and the prospensity for local expenditures to generate income in the local economy. Factors that are normally considered to be directly related to the size of the multiplier include size of population, extent of female participation in the labour force, geographic isolation, per capita income, diversification of the economic base, and relative levels of non-labour income.

The study team has estimated sub-regional employment multipliers in the following way. Using a generally accepted employment multiplier for Alberta of about two (that is, one new basic or export job will create an additional new job in the local economy), adjustments have been made to reflect such factors as the smaller size, lower levels of income, and greater income leakages in the sub-region. This process has been undertaken for the Lower Peace, North Peace, and East Peace sub-regions and differences in their respective multipliers are based on economic base comparisons of the three areas. The estimated employment multipliers for the three sub-regions are given in Table 21 below.

Table 21. Estimated employment multipliers for Lower Peace, North Peace, and East Peace sub-regions.

	PROBABLE RANGE	AVERAGE MULTIPLIER	FORECAST PERIOD
LOWER PEACE	1.4 - 1.8	1.6	1980 - 1995
NORTH PEACE	1.6 - 1.9	1.8	1980 - 1995
EAST PEACE	1.5 - 1.8	1.7	1980 - 1995

Source: Peter C. Nichols & Associates Ltd.

7.1.3 Employment Projections

Table 22 summarizes the employment impact associated with the various sub-regional development scenarios, defined earlier in the study. The basic employment figures are derived from the individual sector analyses; the non-basic employment estimates have been derived by using the "multiplier" considered appropriate to the region.

It should be noted that the employment figures in Table 22 do not include temporary construction jobs accommodated by a non-resident labour force; in the case of the North Peace, particularly, the labour force associated with construction of such projects as the Dunvegan Dam or proposed commercial oil sands plants could be very large.

It is estimated that, in 1980, the employment in the sub-region totalled approximately 8200 positions.[1] On the basis of the employment projections given in Table 22, the number of jobs available in the region would, over the next 15 years, grow by 1% annually under the high scenario, remain generally unchanged under the probable scenario, and decline slightly under the low development case. The decline in agricultural employment associated with continued farmland consolidation and rural out-migration will have a significant effect in terms of offsetting employment growth in other sectors.

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1 Derived by multiplying the sub-regional population in 1980 by the current proportion age 15 years and over (estimated to be 68.8%) by the labour force participation rate (66%, which has been determined by modifying the 1976 rate to include native communities in the sub-region and to reflect likely increases in labour force participation since 1976 on the basis of provincial experience) by the level of employment (96%, or conversely assuming a 4% unemployment level).

Table 22. Employment projections, East Peace sub-region, 1980 to 1995.

SCENARIO	INDUSTRY	CUMULATIVE INCREMENTAL FTE[a] POSITIONS 1985	1990	1995
LOW	Agriculture[b]	(148)	(285)	(402)
	Forestry	(50)	(60)	(70)
	Oil and Gas	10	47	82
	Other	25	50	75
	Total Basic	(163)	(248)	(315)
	Total Non-Basic	(114)	(174)	(220)
	Total All Sectors	(277)	(422)	(535)
PROBABLE	Agriculture[b]	(124)	(237)	(331)
	Forestry	--	20	20
	Oil and Gas	51	105	173
	Manufacturing	25	50	75
	Other	50	100	150
	Total Basic	2	38	87
	Total Non-Basic	1	27	61
	Total All Sectors	3	65	148
HIGH	Agriculture[b]	(100)	(189)	(259)
	Forestry	--	20	300
	Oil and Gas	80	188	308
	Manufacturing	50	100	150
	Other	75	150	225
	Total Basic	105	269	724
	Total Non-Basic	74	188	507
	Total All Sectors	179	457	1231

[a] Full-time equivalent.

[b] Based on 1.59 persons employed per farm unit.

Note: Brackets indicate a reduction in employment.

Source: Peter C. Nichols & Associates Ltd.

7.2 SUB-REGIONAL POPULATION

7.2.1 Introduction

The previous section of the report formulated employment projections for the sub-region to the year 1995. These projections can now be used as a basis for estimating the total population that will be necessary to accommodate the sub-regional employment requirements.

7.2.2 Methodology

The first step taken to determine the employment-based population involved the estimation of total 1980 employment in the sub-region. This was done by working back from the 1980 population estimates for the study area, using an assumed unemployment rate, the 1976 labour force participation rate adjusted to reflect an ongoing upward trend and the presence of native communities which tend to lower sub-regional participation levels, and the estimated proportion of the population of working age. Refer to the footnote for the specific factors used in the analysis.

The projected incremental employment figures for 1985, 1990, and 1995 were subsequently added to the 1980 base employment estimate and the sub-regional population was compiled under the assumptions that labour force participation rates will increase by one percentage point every five years, and that unemployment rates will average 4% over the study period. The proportion of the population above 15 years of age has been projected to 1995, assuming that fertility rates continue to decline. The specific factors used to derive population estimates are given in a footnote to Table 23.

7.2.3 Employment-Based Population Projections

The population projections prepared for the sub-region under the various development scenarios are given in Table 23. Under the low case, the population of the East Peace might decline by as much as 17% between 1980 and 1995; under the probable case the decline is estimated to be about 10%; and in the high case the sub-regional population might increase slightly, by 1.5%, over the next 15 years. By way of comparison, the population of the sub-region has remained relatively stable over the past decade, but the level of development that has occurred in the resource industries over that time is above that anticipated in the coming years. Figure 6 graphically illustrates these projections, as well as the actual data for 1971 and 1976.

The projected lack of population growth for the East Peace reflects in large part the reduced potential for employment generation in the basic resource sectors. It is also attributable to changes in labour force patterns and demographic characteristics. The population analysis assumes that labour force participation rates will continue to increase, primarily through the greater involvement of females in the work force. In addition, the age distribution of the sub-regional population is expected to change markedly over the coming years due to declining fertility levels; the result is that the proportion of children will decline while the percentage of the population in the working age group will increase. The consequence of these factors is that the proportion of the population that is employed will rise from about 44% at present to 49% by 1995 and that many new jobs created can be accommodated without a corresponding change in the population. Stated differently, employment growth in the sub-region will exceed population growth.

It might also be observed that because of declining family sizes due to projected decreases in fertility rates, the number of family units will increase proportionately more than will the population. For example, while the sub-regional population to 1985 under the probable case is shown to decline by approximately 5%, the number of family units is expected to decline by only about 1% during the same period.

Table 23. Employment-based population projections, East Peace sub-region, 1980 to 1995.

SCENARIO	1980 (Estimated)	1985[a]	1990[a]	1995[a]
LOW	19017	17400	16400	15700
PROBABLE	19017	18000	17400	17100
HIGH	19017	18400	18300	19300

a Estimates are based on a declining overall fertility rate and, hence, a rising proportion of the population in the working age group.

Footnote: Factors used to calculate population figures from employment estimates are given below.

	1980 (estimated)	1985	1990	1995
Labour Force Participation Rate (a)	.66	.67	.68	.69
Employment Rate (b)	.96	.96	.96	.96
Proportion of Population 15+ (c)	.688	.714	.731	.741
Proportion of Population Employed (a)x(b)x(c)	.436	.459	.477	.491

Source: Peter C. Nichols & Associates Ltd.

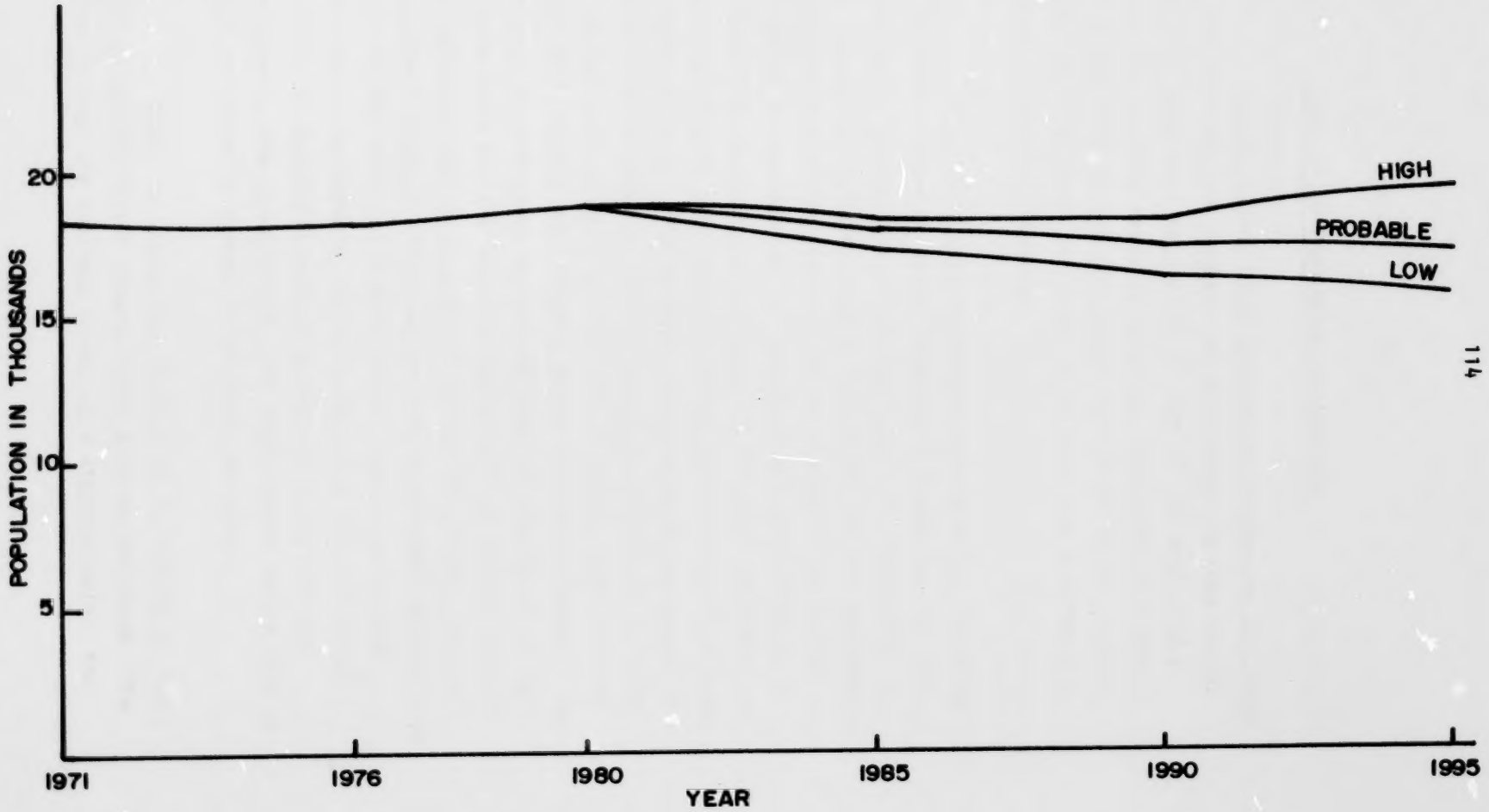

Figure 6

EMPLOYMENT-BASED POPULATION PROJECTIONS
EASTERN PEACE SUB-REGION

Peter C. Nichols & Associates Ltd.

7.2.4 Comparative Population Projections

The employment-based population projections discussed earlier are based on judgments by the consulting team having regard to employment generation in each of the basic industries, the relevant basic to non-basic employment multiplier, and probable changes in population employment rates. Actual departures from these estimates would alter the expected sub-regional population figures.

It is clear that unforeseen developments, including for example changes in senior government industrial and locational policies may also affect employment and population in the sub-region. Entrepreneurial skills can attract employment-generating activities that may not be strongly tied to the sub-region's apparent natural resources and are difficult to foresee. It is similarly difficult to estimate the timing and magnitude of non-basic economic change associated with changes in basic activity. For example, although basic employment in agriculture is shown to decline due to consolidation patterns, it is not clear exactly how the service sector might respond, given that overall agricultural output may be unaffected. The analysis in this study has assumed that if employment in agriculture declines, the negative impact will be carried through the non-basic sector through the multiplier effect. In reality, the multiplier effect may be reduced somewhat because farm expenditures would not drop in direct proportion to farm employment; furthermore, to the extent that service sector activity is reduced because of a decline in agricultural employment, some considerable time might elapse before this is fully reflected in a drop in non-basic employment.

Other considerations related to the timing of indirect or service sector impacts might also be mentioned. The first is that the analysis takes, as a starting point, the

present economic situation and superimposes onto that projected changes in employment. However, it is possible that because of possible lags between the occurrence of new basic activities and their induced non-basic impacts, the economic base used as a starting point may not represent an equilibrium position in the context of earlier developments; accordingly, the analysis might understate projected employment and population figures. Conversely, it is possible that in some instances service sector impacts may precede the occurrence of the basic activity, as individuals speculate that such developments will occur. There is evidence, for example, in the Cold Lake-Bonnyville area that some of the recent service sector growth that has occurred is associated with the expectation that an oil sands project will proceed in the area. It is also possible that some recent non-basic development in the Town of Peace River may be in anticipation of the future construction of the Shell oil sands plant; to the extent that this has happened, the use of the existing economic base may exaggerate the impact of future economic development.

On the basis of these qualifications to the use of employment-based population projections, an alternative set of projections based on recent growth trends in the sub-region has been prepared and is shown in Table 24.

The "recent trend" projections are based on the rates of growth from 1976 to the year of the most recent municipal census for the urban centres and on the 1971 to 1976 growth rate for the remainder of the sub-region. The rates of growth that prevailed in those periods are extrapolated forward. It should, of course, be noted that the use of a constant rate of growth implies that the absolute increase in the population during any particular year is larger than that of the previous year.

Table 24. Alternative population projections, East Peace sub-region, 1980 to 1995.

BASIS FOR PROJECTIONS	1980 (Estimated)	1985	1990	1995
Employment[a]	19017	17400 - 18400	16400 - 18300	15700 - 19300
Recent Trend[b]	19017	19700	20500	21400
Zero-migration[c]	19017	20400	21700	22800

a Refer to Table 23 for details.

b Based on the rates of growth from 1976 to the year of the most recent municipal census for the urban centres, and on the 1971 to 1976 growth rate for the remainder of the sub-region.

c Derived using 1976 age-sex distribution for component municipalities. Present and projected fertility and survival rates are based on Census Division 15 estimates prepared by Alberta Bureau of Statistics. The "medium" fertility rates are used; these imply a decline in fertility to replacement levels. Computer projections to 1981, 1986, 1991, and 1996 were interpolated manually to obtain the figures shown.

Source: Peter C. Nichols & Associates Ltd.

The population figures derived from the trend projections imply an average growth rate to 1995 of only 0.8% annually, but the projections exceed those prepared through the employment analysis.

Both the employment-based and the recent trend population projections for the sub-region suggest that growth will be insufficient to satisfy the zero-migration requirements, which are given in Table 24. The zero-migration projections show what would happen to the sub-regional population if no in-migration or out-migration occurs, and the population responds only to natural growth factors. The fact that the employment projections are below the zero-migration figures implies that net out-migration from the sub-region will occur over the study period. The amount of out-migration will depend on the set of population projections used as a base, but under the probable employment scenario, the net out-migration from the sub-region over the period to 1995 would average about 350 persons per year.

7.2.5 Conclusions

This report provides three sets of population projections based on low, probable, and high employment scenarios and another based on recent population trends in the sub-region. In 1995, the difference between the highest and lowest projections is more than 6000 persons. Depending on the planning purposes for which the figures are required, a range of estimates by the various projections might be used. However, in the judgment of the study team, the employment-based figures derived under the probable to high scenarios are the most appropriate to be used. The population range inherent in the two scenarios amounts to about 13% by 1995 and should allow for some flexibility in the underlying assumptions.

7.3 SUB-REGIONAL POPULATION DISTRIBUTION

7.3.1 Introduction

Population projections for the East Peace sub-region as a whole have been provided earlier in Section 7.2. However, it is important to various local, regional, and provincial authorities to know also how the population of individual municipalities may change within the context of the sub-region. The part of the report that follows explains the methodology by which the projected East Peace population has been distributed among its constituent parts and provides the related intra-area population projections.

7.3.2 Employment-Based Projections

7.3.2.1 Methodology. The projected East Peace population has been allocated among the six incorporated urban centres and the remaining rural parts of the sub-region, which include Indian Reserves, Metis Settlements, and hamlets.

The methodology that has been employed to distribute the projected sub-regional population is described briefly as follows:

1. Derive the 1980 base-year employment for the relevant subsets of the sub-region (in this case, each of the six urban centres plus the remaining rural area) and estimate future employment to population ratios for each of those jurisdictions which are compatible with the overall sub-regional ratio. Adjustments are necessary to recognize differences in labour force participation rates and the age distribution between urban and rural areas;

2. Estimate the basic and non-basic jobs that will accrue to the various parts of the sub-region, based on past patterns and the expected location of the new economic activities;

3. Given the estimates of base-year and incremental employment for a specific jurisdiction, and the estimated employment to population factor for the target year, determine the projected population.

Some of the more important assumptions used to distribute population are discussed below:

1. The decreases in basic agricultural employment will impact entirely on the rural areas. The employment changes that occur in the forestry industry will be evenly split between the urban and rural areas. One-quarter of the increases in oil and gas sector employment will accrue to the rural areas while the remaining three-quarters, including its associated induced indirect employment, will be accommodated at Valleyview.

2. The I.D. 16 and I.D. 17 jurisdictions will increase their proportionate shares of the rural population by 0.3 and 0.2 percentage points every five years, respectively, while the share held by M.D. 130 will decrease correspondingly.

3. All changes in basic and non-basic employment not accounted for in (1) above will be distributed among the urban municipalities in relation to their respective shares of the 1980 urban population.

7.3.2.2 Conclusions. Table 25 provides the results of the population distribution analysis for the employment-based projections. Under all scenarios, the rural population will decline continuously throughout the study period; under the probable case, the rate of decline will amount to slightly more than 1% annually.

The urban population is expected to remain virtually stationary during the next 15 years under the probable scenario. However, Valleyview is projected to grow modestly while the other urban centres might show some marginal reductions in population. Under the high case, all urban centres would exhibit some growth over the study period, averaging 1.4% annually, but Valleyview would grow proportionately faster than the average because of its proximity to oil and gas developments in the sub-region. The study team suggests that the probable and high scenarios encompass the most likely range of population projections for the East Peace.

It must be cautioned that the distribution provided should be used only as a general indication of population change. Reference has been made earlier to potential variations in terms of underlying employment projections and multipliers, and sub-regional population figures. It is evident also that the urban centres in the sub-region are located relatively closely to one another and local development considerations can have an important bearing on where growth occurs. Local promotional efforts, land prices and availability, housing factors, entrepreneurial skills are only a few of the factors that can affect growth in one location versus another.

Table 25. Distribution of employment-based population projections, East Peace sub-region.

	ESTIMATED 1980 POPULATION	RELATIVE CHANGE IN POPULATION COMPARED TO 1980								
		1985			1990			1995		
		LOW	PROBABLE	HIGH	LOW	PROBABLE	HIGH	LOW	PROBABLE	HIGH
RURAL										
M.D. 130	2625	-10%	-9%	-8%	-20%	-18%	-17%	-25%	-23%	-19%
I.D. 16 (portion)	4520	-7%	-6%	-5%	-15%	-13%	-12%	-18%	-15%	-11%
I.D. 17	4335	-7%	-6%	-6%	-15%	-13%	-12%	-18%	-16%	-11%
Sub-Total Rural	11480	-8%	-7%	-6%	-16%	-14%	-13%	-20%	-17%	-13%
URBAN										
High Prairie	2414	-10%	-5%	-2%	-12%	-3%	+3%	-17%	-5%	+13%
Valleyview	2066	-9%	+2%	+9%	-6%	+11%	+28%	-6%	+17%	+52%
McLennan	1212	-10%	-5%	-2%	-12%	-3%	+3%	-16%	-5%	+13%
Falher	1170	-10%	-5%	-2%	-12%	-3%	+3%	-16%	-5%	+13%
Girouxville	315	-10%	-5%	-2%	-12%	-3%	+3%	-16%	-5%	+13%
Donnelly	360	-10%	-5%	-2%	-12%	-3%	+3%	-16%	-5%	+13%
Sub-Total Urban	7537	-10%	-3%	+1%	-10%	+1%	+10%	-14%	+1%	+24%
TOTAL POPULATION	19017	-9%	-6%	-3%	-14%	-8%	-4%	-17%	-10%	+2%

Source: Peter C. Nichols & Associates Ltd.

7.3.3 Trend Projections

7.3.3.1 Methodology. The population trend projections for the sub-region assume a continuation of recent growth experience. Future changes in the population of the East Peace have been distributed among the various jurisdictions on the basis of their respective shares of sub-regional growth during the 1976 to 1980 period. No account has been taken of the effects of boundary adjustments and annexations on the historical population growth of specific municipalities.

7.3.3.2 Conclusions. Table 26 provides the distribution results for the population trend projections. These projections imply a higher rate of growth than do those developed using the employment analysis as a basis, and this is reflected in higher population figures by 1995 for all jurisdictions. Even under the trend projections, however, the urban growth is still quite low, with all centres combined increasing by an average 2.2% per year.

Table 26. Distribution of population trend projection, East Peace sub-region[a].

	1980	1985	1990	1995
RURAL				
M.D. 130	2625	2509	2421	2337
I.D. 16 (portion)	4520	4468	4449	4423
I.D. 17 (portion)	4335	4277	4247	4214
Sub-Total Rural	11480	11254	11117	10974
URBAN				
High Prairie	2414	2586	2765	2952
Valleyview	2066	2519	2991	3483
McLennan	1212	1315	1422	1533
Falher	1170	1235	1303	1374
Girouxville	315	331	347	364
Donnelly	360	466	577	693
Sub-Total Urban	7537	8452	9405	10399
TOTAL POPULATION	19017	19706	20522	21373

a For the rural municipalities, it is assumed that I.D. 16 and I.D. 17 will increase their proportionate share of rural population by 0.3 and 0.2 percentage points every five years, respectively. For urban centres, allocation of future growth based on distribution of estimated growth between 1976 and 1980.

Source: Peter C. Nichols & Associates Ltd.

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9. APPENDICES

9.1 MUNICIPAL ANALYSIS

9.1.1 Introduction

This appendix will discuss, in turn, each of the incorporated urban centres of the sub-region. A brief historical background of each community is provided together with a sketch of its historical growth. This is followed by a description of the local economic base and an assessment of what structural changes and growth may be anticipated in the context of sub-regional developments. Population projections for the community are also included; these were derived from Section 7.3 of the main text.

9.1.2 Town of High Prairie

9.1.2.1 Background. The Town of High Prairie is located 364 kilometers northwest of the City of Edmonton via Highway 2 and is served by the Northern Alberta Railway. The community, with a current population of about 2400 persons, functions essentially as an agriculture and forest industry service centre.[1]

The first large influx of people occurred during the Klondike Gold Rush in 1898. During this period Lesser Slave Lake Settlement (now Grouard) developed as a port of entry to the Peace River Country. Farming gradually developed in those areas with favourable soil conditions; initially around the Lesser Slave Lake Settlement itself, followed after 1904 in the High Prairie area. High Prairie became the centre of a

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1 The following two paragraphs have been taken from the Town of High Prairie General Municipal Planning Study, prepared by the Peace River Regional Planning Commission. January, 1979.

prosperous agricultural area and its first school was built in 1908.

With the completion of the Edmonton, Dunvegan and British Columbia Railway in 1914 and 1915 the settlement began to grow, and by 1915 there were two stores, a blacksmith shop, a livery barn, a church, a post office, a hotel, a school and by 1920, a hospital. The first grain shipments left High Prairie in 1916 and an elevator was constructed in 1917. The favourable world market for agricultural products plus promotion of the Peace Country for homesteading by the Canadian Government caused a boom in the Peace River area after the First World War. The settlement of High Prairie was incorporated as a Village on April 6th, 1945 and as a Town on January 10th, 1950.

9.1.2.2 Historical population growth. Historical population figures for the community are shown below. The most significant growth occurred during the 1950's and early 1960's. Since that time, only minimal growth has been experienced. Between 1971 and 1976, the local population declined marginally but a recent municipal census indicates that this trend has been reversed; the town's population now stands at 2414 persons.

High Prairie - Historical Population[a]

1951	1141
1961	1756
1966	2241
1971	2354
1976	2281
1980	2414

a 1951 to 1976 figures from Town of High Prairie General Municipal Planning Study, Peace River Regional Planning Commission, 1979. 1980 figures from High Prairie municipal census.

9.1.2.3 Economic base. Information regarding the structure of the local economic base in High Prairie can be derived from 1971 Canada Census data. Although the data are now several years old, it is not believed that significant changes in industry composition have occurred, in view of the modest local growth that has been experienced. Manufacturing and public administration account for a relatively high proportion of local employment; the former is related to the sawmill operations in the immediate area and the latter to the large provincial government presence in the community, particularly as it relates to social services and vocational education (the facilities for the latter are concentrated at Grouard). By comparison to most other urban centres, a small proportion of the local labour force is engaged in the construction industry and this can probably be attributed to the nominal level of growth that has occurred in the area.

High Prairie serves as the dominant trading centre in the East Peace and accounts for about 40% of its total retail and service volume. Toward the western part of the sub-region,

Falher and Valleyview take on an increasingly important role and both Peace River and Grande Prairie, which lie outside the East Peace, are major service centres which attract high-order trading activity from the region. Slave Lake and Edmonton, to the east and southeast of High Prairie, also serve as magnets for sub-regional trading volume. It is estimated that High Prairie serves a market equivalent to roughly two and one-half times its own population. (Refer to Table 20.)

Retail and service trade data that are available indicate that since 1971 High Prairie has maintained its share of sub-regional trading activity. Figures available for the period 1971 to 1977 suggest that the number of retail outlets during that period remained quite stable, while the number of service outlets increased quite significantly between 1975 and 1977. A further comparison of 1971 and 1979 telephone listings for the community, however, suggests that the number of retail establishments has increased by 40% since 1971, but the new firms may have been added in only the past two or three years.

9.1.2.4 Outlook. The growth prospects for High Prairie are constrained by the rather small catchment area served by the community and the limited resource opportunities in its hinterland. The forestry sector appears to have limited expansion potential in the area and, indeed, it is possible that further industry consolidation could reduce employment. New agricultural lands will continue to be opened for development but at a lower than historical rate and the rural farming population is likely to continue to decline. The oil and gas industry in the East Peace is largely served from Valleyview or Slave Lake and this is unlikely to change. In terms of retail and service trade, the community may face greater competition in its traditional trading area from larger or more rapidly growing urban centres to the west.

High Prairie is the service centre to a large native population, which is economically underdeveloped. To the extent that new or enlarged government programs are implemented to address native problems or that economic development in the native communities accelerates, High Prairie would be a primary beneficiary and could grow accordingly. The Town's historical role as a forest products centre may also assist the community to capitalize on secondary processing opportunities in that industry.

It is possible that a modular buildings and fibre pipe manufacturing plant may be constructed in the immediate High Prairie area. The plant might initially employ 40 persons, increasing to possibly 150 perons in later stages. The potential development of this project is not reflected in the employment-based population projections for the Town, but it is clear that if the business proceeds it would have a positive growth impact on the town.

9.1.2.5 Population projections. Two sets of population projections have been developed for High Prairie as part of this study. The first set is derived from the employment analyses and allocates to the community its share of sub-regional population change based on expected economic activity levels and employment generation in the local area. Although low, probable, and high cases are illustrated, the study team suggests that for most purposes the probable and high scenarios encompass the most likely range of population projections for the Town. The second set of projections assumes a continuation of recent population trends and allocates future growth to the community in proportion to its share of sub-regional growth experienced between 1976 and 1980. These sets of projections are given below. Also shown, for comparative purposes, are the growth projections contained in the Town's General Municipal Planning Study; these are based on a 4% annual rate of growth

from 1976 to 1996. This rate of growth exceeds the recent experience of the Town and the resulting projections considerably exceed those prepared on the basis of employment analyses and recent growth trends.

YEAR	EMPLOYMENT-BASED Low	Probable	High	GROWTH TREND	MUNICIPAL PLANNING STUDY
1980 (actual)	2414	2414	2414	2414	2414
1985	2164	2282	2363	2586	3246
1990	2125	2333	2477	2765	3950
1995	2013	2286	2718	2952	4806

9.1.3 Town of Valleyview

9.1.3.1 Background. The Town of Valleyview is located 349 kilometers northwest of the City of Edmonton and is considered to be a main portal to the Peace River country; it serves as a major transportation junction to both the Alaska and Mackenzie Highways.

The Town's importance and growth dates primarily from 1950, when petroleum resources were discovered in the area. The ongoing development of the sub-regional oil industry, the increased significance of agricultural activities in the Town's hinterland, and the growth in the community's transportation service function in response to higher traffic flows to the north have all contributed to the growth of Valleyview. The current population is now approaching 2100 persons.

9.1.3.2 Historical population growth. Historical population figures for the community are shown below. The most significant growth occurred during the 1950's and early 1960's. Since

that time, the growth rate has been modest and, during the 1971 and 1976 period, the population remained stable. However, the results of the 1980 municipal census indicate that further growth has been experienced over the past four years.

Valleyview - Historical Population[a]

1951	--
1956	973
1961	1077
1966	1827
1971	1708
1976	1716
1980	2066

[a] Population figures for 1951 to 1966 from An Economic Base Study of the Peace River Region of Alberta, K.J. Fairbairn and R.G. Ironside, 1973. 1971 and 1976 figures from Statistics Canada, Census of Canada. 1980 figures from Valleyview municipal census.

9.1.3.3 Economic base. Information regarding the structure of the economic base in Valleyview can be derived from 1971 Canada Census data.[1] Although the data are now several years old, no significant changes in industry composition are believed to have occurred, in view of the modest local growth that has been experienced through much of the 1970's. The only primary or basic industry of particular note in the local economy is the petroleum industry, which accounts for about 13% of total employment. Manufacturing activity is quite unimportant. For a community of its size, Valleyview has a relatively

1 Labour Force by Industry, Census of Canada 1971.

small proportion of its labour force engaged in retail or wholesale trade activities or in public administration. Senior levels of government do not have a large local presence although the administrative offices of the East Smoky School Division are located in the community and the provincial Departments of Transportation and Parks and Recreation have regional offices there. On the other hand, more than one-third of the local employment base is attributable to service activities. A comparison of 1971 and 1979 telephone listings for the community suggests that the number of petroleum servicing and construction-related firms have increased significantly in the past few years and comprise an important part of the economic fabric of the Town.

Valleyview accounts for about one-quarter of the total retail and service volume in the East Peace. It is estimated that the Town serves a market equivalent to more than twice its own population. (Refer to Table 20.) Over the past several years Valleyview has increased its share of sub-regional trade; this probably reflects in part the fact that economic growth has been weighted somewhat heavier in favour of the south-western part of the sub-region. It is clear, however, that to the east High Prairie, to the west Grande Prairie, and to the north Falher and Peace River exert considerable competitive forces which constrain the potential growth of the Town's retail and service sector.

9.1.3.4 Outlook. The growth prospects for Valleyview appear to be tied most strongly to developments in the oil and gas industry, particularly in the area lying south-west of the Town, to the continued expansion of the agricultural base in its hinterland, and to the community's role as a service and accommodation centre for highway traffic to and from the north.

As discussed in Section 6.4.6, the growth of the oil and gas industry is sensitive to a number of sub-regional and extra-regional factors which will have an impact on the development of Valleyview. However, continued growth in the industry's importance is expected, with Valleyview being the main urban beneficiary in the sub-region. Economic development in the area served by the Alaska Highway, particularly the Grande Prairie and northeast British Columbia areas, is expected to be robust and this should serve to increase the demand for transportation-related services in the Town. An increase in tourist flows on the Mackenzie and Alaska Highways should have a similarly salutary effect on Valleyview.

On the other hand, the prospects for Valleyview to evolve into a high-order trading centre are not encouraging because of the limited (though growing) hinterland population served by the community and the competition from the larger, established centres of Grande Prairie and Peace River.

9.1.3.5 Population projections. Two sets of population projections have been developed for Valleyview as part of this study. The first set is derived from the employment analyses and allocates to the community its share of sub-regional population change based on expected economic activity levels and employment generation in the local area. Although low, probable, and high cases are illustrated, the study team suggests that for most purposes the probable and high scenarios encompass the most likely range of population projections for the Town. The second set of projections assumes a continuation of recent population trends and allocates future growth to the community in proportion to its share of sub-regional growth experienced between 1976 and 1980. These sets of projections are given below.

YEAR	EMPLOYMENT-BASED			GROWTH TREND
	Low	Probable	High	
1980 (actual)	2066	2066	2066	2066
1985	1886	2098	2248	2519
1990	1952	2291	2644	2991
1995	1946	2420	3146	3483

9.1.4 Town of McLennan

9.1.4.1 Background. The Town of McLennan is located 414 kilometers northwest of the City of Edmonton and lies on the southern shore of Lake Kimiwan. The immediate agricultural area was first surveyed for homesteads in 1905 and the townsite itself was accessed by railway and surveyed in 1915. The hamlet became the main divisional point for what was the Northern Alberta Railway; McLennan is the junction for separate lines extending northwest to Hines Creek and west to Spirit River and Grande Prairie. The former rail line was later connected to the Great Slave Lake Railway serving High Level and Hay River.

The Town's economic function is tied largely to its role as a railway transportation hub, a highway service centre between Slave Lake and Peace River, and a trading centre to the surrounding agricultural area. The community also has a large active treatment hospital serving the northern and central part of the sub-region. The current population of McLennan is in the order of 1200 persons.

9.1.4.2 Historical population growth. Historical population figures for McLennan are shown below. Over the past three decades the local population has remained very stable, although it has exhibited a slight upward trend.

McLennan - Historical Population[a]

1951	1074
1956	1092
1961	1078
1966	1104
1971	1090
1976	1133
1979	1212

[a] Population figures for 1951 to 1966 from An Economic Base Study of the Peace River Region of Alberta, K.J. Fairbairn and R.G. Ironside, 1973. 1971 and 1976 figures from Statistics Canada, Census of Canada. 1979 figures from Alberta Municipal Affairs.

9.1.4.3 Economic base. Information regarding the structure of the economic base of the Town can be derived from 1971 Canada Census data.[1] Although the data are now several years old, no significant changes in industry composition are believed to have occurred, in view of the modest local growth that has been experienced through the 1970's. By most urban standards, the primary and manufacturing industries are under-represented in the Town, while the construction, transportation and services sectors are relatively significant. The importance of the construction sector is primarily associated with the local presence of a mechanical contracting firm which obtains most of its work outside the community. The transportation sector owes its significance largely to the Town's role as a railway divisional point, while the local presence of a 69-bed hospital plus dental and medical clinics contributes to the Town's function as a personal services centre.

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1 Labour Force by Industry, Census of Canada 1971.

On the basis of 1971 labour force information, the retail and wholesale trade industry in McLennan appears quite undeveloped. This is confirmed by retail and service trade data which indicates that the Town's share of sub-regional trade is about 4% and has declined somewhat over the years. Indeed, the total trade volume in the community is only about one-half of the expenditures potential of its own population, an unusual situation for an urban centre. This is undoubtedly attributable to the proximity of established service centres such as Falher, and outside the sub-region, of Peace River and Grande Prairie.

9.1.4.4 Outlook. The population of McLennan has been relatively stable for many years and there are no major developments anticipated at this time that suggest a departure from this historical experience.

The town serves to some degree as an agricultural service centre to the surrounding areas, but this influence is constrained by the proximity of other urban centres nearby. Moreover, although some new lands are being opened for development, the farming sector is experiencing consolidation trends which are more than offsetting any increases in rural population.

The growing dominance of the larger urban centres in the Peace River region will also pose serious constraints to the development of the local retail and service centre.

The outlook for significant spin-offs from other primary industries, such as the oil and gas and forestry sectors is also quite uncertain at this time.

However, the Town's function as an important health centre in the sub-region together with prospects for further related expansion should strengthen the local economic base. The upgrading of transportation links to High Prairie has also increased traffic flows through the community and the impact of this is being felt in the form of added highway commercial activity. Railway operations may be expanded locally but the size and timing of these changes remain speculative. The Town has also been successful in the past in encouraging individual business establishments to develop locally; these firms supply goods and services beyond the immediate local area and include a large bakery, a mechanical contracting firm, a concrete block plant, and an electrical contracting firm. The construction of a truss fabrication plant is proposed. Given the relatively small size of the community, a limited number of such operations, which are not tied directly to a specific resource base, can have a substantial local growth impact. It is not possible, however, to forecast the possible timing and development of such individual and rather "foot loose" operations.

9.1.4.5 Population projections. Two sets of population projections have been developed for McLennan as part of this study. The first set is derived from the employment analyses and allocates to the community its share of sub-regional population change based on expected economic activity levels and employment generation in the local area. Although low, probable, and high cases are illustrated, the study team suggests that for most purposes the probable and high scenarios encompass the most likely range of population projections for the Town. The second set of projections assumes a continuation of recent population trends and allocates future growth to the community in proportion to its share of sub-regional growth experienced between 1976 and 1980. These sets of projections are given below, and compared with estimates contained in the Town's Municipal Planning Study.

YEAR	EMPLOYMENT-BASED Low	Probable	High	GROWTH TREND	MUNICIPAL PLANNING STUDY[a]
1980 (actual)	1212	1212	1212	1212	--
1985	1088	1148	1188	1315	1500
1990	1068	1173	1246	1422	--
1995	1013	1150	1367	1533	2000

[a] Town of McLennan General Municipal Plan (Preliminary Report), Peace River Regional Planning Commission, 1980.

9.1.5 Town of Falher

9.1.5.1 Background. The district surrounding Falher was first surveyed for homesteads in 1909 and was largely settled by the time the railway (later the Northern Alberta Railways) was extended into the area in 1916. The townsite was surveyed in 1919 and initially grew around a centre of Roman Catholic activities, including a church, convent, and schools. The Town is located approximately 430 kilometers northwest of Edmonton and 67 kilometers south of the Town of Peace River.

The Town's primary function is that of an agricultural service and processing centre to the surrounding region. The local population is currently approaching 1200 persons.

9.1.5.2 Historical population growth. Historical population figures for Falher are shown below. Over the past 15 years, the Town's growth has been modest but consistent, averaging 2.5% annually.

Falher - Historical Population[a]

1951	575
1956	802
1961	741
1966	843
1971	918
1976	1120
1979	1162

a Population figures for 1951 to 1966 from An Economic Base Study of the Peace River Region of Alberta, K.J. Fairbairn and R.G. Ironside, 1973. 1971 and 1976 figures from Statistics Canada, Census of Canada. 1979 figures from Falher municipal census.

9.1.5.3 Economic base. Information regarding the structure of the economic base of the Town can be derived from 1971 Canada Census data.[1] Although the data are several years old, and the Town's size and structure have changed somewhat since 1971, the census information provides some measure of the local industry composition. By urban standards, Falher has a large share of its employment base engaged in the agricultural industry. The retail and service sector, particularly with respect to financial services, also accounts for a relatively important part of local economic activities while public administration comprises a small part. Less than one percent of the provincial government employment in the East Peace sub-region is located in Falher. The size of the local manufacturing base is similarly small, although there are two feed manufacturers in the Town and one was established as recently as 1976.

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1 Labour Force by Industry, Census of Canada 1971.

After High Prairie and Valleyview, Falher is the third largest retail and service centre in the East Peace sub-region, accounting for almost one-fifth of total trading volume. (Refer to Table 20.) This share has remained virtually unchanged over the past several years. The community serves a total market more than double its own population, but is geographically restricted in terms of the size of its catchment area given the relative proximity of other middle- and high-order urban centres in the sub-region.

9.1.5.4 Outlook. The population of Falher has grown at a modest pace over the years and there are no major developments anticipated at this time that might suggest a departure from this historical experience.

The Town serves primarily as an agricultural service centre and its future development appears to be tied to that function together with the potential for additional agricultural-processing activities. Honey processing and packaging is considered to be one area of possible development. Notwithstanding this, it must be recognized that regional consolidation trends in farming are generally offsetting the effects of new farmland development in terms of population impact and this will limit the growth in service trade in urban centres such as Falher. Moreover, the expansion of high order centres such as Peace River and Grande Prairie and their attainment of trading thresholds which justify the provision of a broader range and selection of goods and services, will also pose competitive constraints to the Town's commercial development.

The success with which Falher can attract individual business establishments which are not tied directly to a specific resource base will also have a significant bearing on the growth of the Town, but it is not possible to forecast the possible timing and extent of this development.

9.1.5.5 Population projections. Two sets of population projections have been developed for Falher as part of this study. The first set is derived from the employment analyses and allocates to the community its share of sub-regional population change based on expected economic activity levels and employment generation in the local area. Although low, probable, and high cases are illustrated, the study team suggests that for most purposes the probable and high scenarios encompass the most likely range of population projections for the Town. The second set of projections assumes a continuation of recent population trends and allocates future growth to the community in proportion to its share of sub-regional growth experienced between 1976 and 1980. These sets of projections are given below. Also shown, for comparative purposes, are the growth projections contained in the Town's General Plan, prepared in 1977. The latter are based on a future growth rate of 3.3% annually. This rate exceeds the level experienced during the 1976 to 1979 period and the resulting projections exceed those prepared on the basis of the employment analyses and recent growth trends.

YEAR	EMPLOYMENT-BASED			GROWTH TREND	GENERAL PLAN[a]
	Low	Probable	High		
1980 (actual)	1170	1170	1170	1170	1274
1985	1051	1108	1147	1235	1497
1990	1031	1132	1202	1303	1759
1995	978	1109	1319	1374	2067

a Town of Falher General Plan, Peace River Regional Planning Commission, 1977. Figures derived using projection forumla given in the Plan.

9.1.6 Village of Girouxville

9.1.6.1 Background. The Village of Girouxville is a mature agricultural service centre located just off Highway 49, nine kilometers west of Falher. The community is served by the Northern Alberta Railways but is located away from the main trunk highways that pass through the sub-region.

Girouxville is a predominantly French settlement -- in 1976 more than 80% of the local population declared the French language to be its mother tongue. The size of the village has been stable for several years at slightly more than 300 persons.

9.1.6.2 Historical population growth. Historical population figures for the community are given below. No demonstrable growth has been evident over the period since 1956, with the population remaining relatively stable for several years.

Girouxville - Historical Population[a]

1956	300
1961	318
1966	305
1971	347
1976	303
1979	315

a Population figures for 1956 to 1966 from An Economic Base Study of the Peace River Region of Alberta, K.J. Fairbairn and R.G. Ironside, 1973. 1971 and 1976 figures from Statistics Canada, Census of Canada. 1979 figures from Alberta Municipal Affairs.

9.1.6.3 Economic base. Information regarding the structure of the economic base in Girouxville can be derived from 1971 Canada Census data.[1] No significant changes in industry composition are believed to have occurred over the past several years. For an urban centre, the primary industries, particularly agriculture, are quite important and account for about one-fifth of local employment. The manufacturing, construction, transportation and public administration sectors are relatively small by urban standards, whereas retail and service trade accounts for a more significant share of the local economic base.

Girouxville serves as a trading centre for a surrounding agricultural area but its catchment area is constrained by the proximity of larger urban centres. Since 1971, the community's share of sub-regional trade has declined somewhat and this probably reflects both the maturity of its own market area and the increased competition from other centres.

9.1.6.4 Outlook. The economic base of Girouxville is tied primarily to the surrounding agricultural area, which is largely developed and being subject to consolidation trends which are reducing the rural farm population. The community is not located on the periphery of a settled area such that it might otherwise participate in potential resource developments, for example in the oil and gas and forestry sectors. The proximity of the village to larger trading centres such as Falher, Peace River and Grande Prairie also poses major competitive forces to the community and limits the geographic trading market that it might serve.

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1 Labour Force by Industry, Census of Canada 1971.

Accordingly, the outlook for Girouxville is that it will remain fairly constant in size. The potential to attract agricultural-related service or processing businesses as well as other establishments that are non-related to the local resource base and which serve sub-regional markets, will provide opportunities for some growth or to at least maintain the size of the community in the face of farmland consolidation and rural out-migration trends in the area.

9.1.6.5 Population projections. Two sets of population projections have been developed for Girouxville as part of this study. The first set is derived from the employment analyses and allocates to the community its share of sub-regional population change based on expected economic activity levels and employment generation in the local area. Although low, probable, and high cases are illustrated, the study team suggests that for most purposes the probable and high scenarios encompass the most likely range of population projections for the Village. The second set of projections assumes a continuation of recent population trends and allocates future growth to the community in proportion to its share of sub-regional growth experienced between 1976 and 1980. These sets of projections are given below.

YEAR	EMPLOYMENT-BASED			GROWTH TREND
	Low	Probable	High	
1980 (actual)	315	315	315	315
1985	284	299	310	331
1990	278	306	325	347
1995	264	300	356	364

9.1.7 Village of Donnelly

9.1.7.1 Background. The Village of Donnelly is a mature agricultural and highway service centre located at the junction of Highways 2 and 49 and served by the Northern Alberta Railways. Donnelly is located 63 kilometers south of Peace River.

Donnelly is a predominantly French settlement; in 1976 almost three-quarters of the local population declared French to be its mother tongue. The community's population remained fairly stable for many years but has increased in the past three or four years and now stands at approximately 340 persons.

9.1.7.2 Historical population growth. Historical population figures for the community are given below. No demonstrable growth was evident during the two decades from 1956 to 1976. However, based on recent municipal census figures, it appears that the village has grown by almost 7% annually over the past three years.

Donnelly - Historical Population[a]

1956	265
1961	289
1966	249
1971	274
1976	278
1979	340

a Population figures for 1956 to 1966 from An Economic Base Study of the Peace River Region of Alberta, K.J. Fairbairn and R.G. Ironside, 1973. 1971 and 1976 figures from Statistics Canada, Census of Canada. 1979 figures from Donnelly municipal census.

9.1.7.3 Economic base. Information regarding the structure of the economic base in Donnelly can be derived from 1971 Canada Census data.[1] No significant changes in industry composition are believed to have occurred over the past several years. For an urban centre, the primary industries, particularly agriculture, are important sources of employment. The construction, retail trade and services sectors are also relatively important. The significance of the services industry appears to be related to the village's education function. On the other hand, the manufacturing and public administration industries provide only modest sources of local employment.

Donnelly provides a retail and service function to the surrounding area but its catchment area is quite small. Trading volume in the community is only slightly in excess of the total expenditures potential of its own population. (Refer to Table 20.) Furthermore an analysis of historical retail and service data for the sub-region indicates that the community's share of total activity declined quite materially between 1971 and 1977, although this trend may have reversed since then. A difficulty faced by Donnelly relates to the proximity of McLennan and Falher, as well as the high-order urban centres of Grande Prairie and Peace River; these communities present a very competitive environment to the local trading sector.

9.1.7.4 Outlook. The population of Donnelly has remained quite stable for many years and there are no major developments anticipated at this time that might suggest a departure from this historical experience.

The community's function as a service centre to the surrounding area will continue to be constrained by the trend toward further farmland consolidation and rural out-migration,

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1 Labour Force by Industry, Census of Canada 1971.

and the competition from middle- and high-order centres in the sub-region.

The most promising opportunities appear to be related to the community's location at the crossroads of two important transportation routes. Donnelly is conveniently located midway between High Prairie or Valleyview and the Town of Peace River and to the extent that economic development and tourism farther to the north is promoted, this could have a beneficial impact to the Village in terms of highway commercial activity. Although difficult to forecast, it is also possible that new non-resource based firms drawn to the Peace River region generally and serving a wider geographic market could as readily be attracted to Donnelly as other communities; this will depend on local development and entrepreneurial interest.

9.1.7.5 Population projections. Two sets of population projections have been developed for Donnelly as part of this study. The first set is derived from the employment analyses and allocates to the community its share of sub-regional population change based on expected economic activity levels and employment generation in the local area. Although low, probable, and high cases are illustrated, the study team suggests that for most purposes the probable and high scenarios encompass the most likely range of population projections for the Town. The second set of projections assumes a continuation of recent population trends and allocates future growth to the community in proportion to its share of sub-regional growth experienced between 1976 and 1980. These sets of projections are given below.

YEAR	EMPLOYMENT-BASED			GROWTH TREND
	Low	Probable	High	
1980 (actual)	360	360	360	360
1985	324	341	353	466
1990	318	349	370	577
1995	301	342	407	693

9.2 URBAN LAND USE REQUIREMENTS

9.2.1 Introduction

As part of the terms of reference for the study, the consultants were to examine briefly the indicated land use requirements of the urban centres in the study area, based on the growth projections derived. These land use requirements are discussed in this section.

9.2.2 Town of High Prairie

A General Municipal Plan for the Town of High Prairie was prepared during 1978 by the Peace River Regional Planning Commission. The document provides an analysis of the existing land use in the community and examines the land use implications of the community growing from a population of 2281 persons in 1976 to approximately 3500 over a five to ten year period and to 5000 over a twenty-year horizon. This expansion was premised on a 4% average annual compounded growth rate.

The projections given in this report, by comparison, suggest that the town's population is likely to remain relatively unchanged in the foreseeable future. Should this occur, little increase in the community's absolute land requirements can be anticipated although on-going changes in land use

patterns would undoubtedly occur. Certainly, the projected land requirements given in the General Municipal Plan would seem to be more than sufficient to accommodate the potential growth needs inherent in any of the economic development scenarios formulated in this report.

9.2.3 Town of Valleyview

The population projections provided earlier in this report suggest that the Town of Valleyview will remain relatively stable in the short-term and that by 1995 the local population is likely to be about 17% higher than at present. Under the most optimistic development scenario, the Town might increase in size by somewhat more than one-half over the next fifteen years.

To accommodate this growth, Valleyview's land requirements would increase in a roughly proportionate manner, and the projected urban land requirements to 1995 are shown in Table 27. It has been assumed that incremental land consumption can be satisfied through the undeveloped land supply presently within the Town boundaries; this appears to be sufficient to accommodate all demand over the next fifteen years.

9.2.4 Town of McLennan

Land use data for the Town of McLennan have been obtained from the Peace River Regional Planning Commission and apply to the situation that existed in 1979. That information indicates that the community had developed land totalling 91 acres, with an additional 192 acres comprising subdivided vacant or agricultural lands. The population projections for McLennan which have been discussed earlier in the report indicate that the size of the Town is likely to remain relatively

Table 27. Land use requirements, Town of Valleyview.

LAND USE	1980[a]	1995[b] DEVELOPMENT SCENARIO		
		Low	Probable	High
	---------- hectares ----------			
Residential	43.74	N.C.[c]	51.2	66.6
Commercial	19.60	N.C.	23.0	29.8
Institutional	24.90	N.C.	29.2	37.9
Recreational	5.67	N.C.	6.6	8.6
Utilities, Transportation, and Communication	2.70	N.C.	3.2	4.1
Storage and Industrial	30.05	N.C.	35.2	45.8
Streets and Lanes	52.29	N.C.	61.2	79.6
Total Developed	178.95	N.C.	209.6	272.4
Undeveloped	217.68	N.C.	187.03	124.23
Total	396.63	N.C.	396.63	396.63

a Source: Peace River Regional Planning Commission.

b Peter C. Nichols & Associates Ltd.

c No change from 1980 level.

Note: Projections made on basis proportional to population growth.

stable, and consequently, little change in land absorption is anticipated. Assuming no servicing or site constraints, the available vacant land within the municipality should readily meet foreseeable land requirements.

9.2.5 Town of Falher

A General Plan for the Town of Falher was prepared in 1977 by the Peace River Regional Planning Commission. The Plan provides current land use data and projected requirements to the year 2001. The projections were premised on an average growth in the community of 3.28% annually, with an ultimate population of more than 2100 persons by 1996 and 2500 persons by 2001.

By comparison, the population estimates prepared as part of this sub-regional study show the community to remain relatively unchanged in size over the next fifteen years, with a maximum population under the high development scenario of about 1300 persons by 1995. This represents an increase of about 13% over the 1980 population and does not imply a major effect on land absorption. The land requirements projected in the General Plan should be more than sufficient to accommodate the Town's future growth.

9.2.6 Villages of Girouxville and Donnelly

No current land use data are available for the communities of Girouxville and Donnelly. However, these villages are expected to remain relatively stable in size and, under the high-growth scenario, might increase by a modest 13% over the next fifteen years. With land absorption expected to generally parallel change in the local population, no significant changes in the land use requirements of the two centres are envisaged.

9.3 STEERING COMMITTEE COMMENTS AND OBSERVATIONS

9.3.1 Introduction

During the course of carrying out this study, the consulting team reported periodically to a steering committee which consisted of representatives from the various urban and rural municipalities in the sub-region. At the conclusion of the assignment, the steering committee reviewed the final draft report and expressed a number of observations and concerns regarding the findings. The comments offered by committee members are summarized in this Appendix.

9.3.2 Comments and Observations

9.3.2.1 Reliability of population projections. Concern has been expressed regarding the level of accuracy of the sub-regional and municipal population projections in the report, given the long-term time frame being considered, and the numerous assumptions and judgmental factors that underly the figures provided.

It has been pointed out by the Smoky River Regional Economic Development Board (SRREDB) that the export base model used in the study is based upon the observation that in any economic region, there is an historical relationship between changes of employment in a region's "basic" industries and changes in its total employment and population. These relationships or multipliers differ from region to region and within each region over time. In this study, the multipliers were not developed from regional data but rather upon judgments regarding modifications from "generally agreed upon" provincial multipliers. Because very small differences in the size of a multiplier can have significant effects on the magnitude and direction of employment and population sizes, the Board has

stated that the scope for error in the employment projections is quite high and further compounded when applied to projections for specific industries which are also highly judgmental. Although many of the errors may cancel out for the sub-region as a whole, thus allowing some degree of reliability for that larger area, the scope for error is compounded many times when the model is applied to small municipal populations. The Smoky River Regional Economic Development Board has argued that, in fact, the scope for error is so high that the application of the model is inappropriate and the individual municipal projections are almost meaningless. Further, that while it might be academically interesting to develop specific municipal projections, this interest must be weighed against the unreliableness of the projections and the potential for harmful effects that a wrong projection might have.

Reference has also been made by the SRREDB to a further reason why the export base model is inappropriate for use at the level of individual communities. While some towns may be clearly tied to the growth of the surrounding region's export industries, others may depend instead on developments which occur outside the study region. An example provided by the committee is that of the Town of McLennan, the growth of which is attributed in large part to its function as a railway and construction contracting centre for an area beyond the immediate sub-region. It is not felt that the model used in the report can account for the likely increases in employment due to the expansion of such functions.

Given these various considerations, the steering committee has agreed that a range of population figures be used for most purposes and that specific numeric estimates given in the report should be considered only as order-of-magnitude indications of future population.

9.3.2.2 Sub-regional growth. The steering committee feels generally that the economic report understates the growth potential of the sub-region and the likely level of development that will be experienced over the next fifteen years, and would caution the reader that the report does not necessarily reflect the policies, objectives, or views of the constituent municipalities in the East Peace sub-region. Individuals interested in obtaining detailed economic and development information for particular municipalities should contact the local administrative offices.

9.3.2.3 Agricultural sector. Members of the steering committee from the Smoky River Regional Economic Development area are of the opinion that the report overestimates the decrease in employment that will occur in the agricultural sector. The members feel that notwithstanding the changes in farmland consolidation that may occur, employment may not be correspondingly reduced because some additional persons will be needed to work the remaining, larger farm units. Furthermore, it is felt that the population projection model used in the report does not recognize that as capital is substituted for labour in the agricultural sector, the capacity of the remaining farm work force to generate further employment through higher incomes and productivity will be increased.

9.3.2.4 Definition of study area. Reservations have been expressed by certain members of the steering committee, and in particular those representing the Town of Valleyview, regarding the appropriateness and validity of including municipalities with different economic bases and prospects within the same sub-regional boundaries. Valleyview, it is felt, is relatively independent from, and unique to, the remainder of the East Peace and its economic outlook may be masked by including it within a larger area that is quite stable and mature. The Town is considered to be a focus for increasing commercial activity

because of its strategic highway position, is the centre for an expanding oil and gas industry in the area, and is benefiting from continuing agricultural expansion in the surrounding hinterland. The Town's growth outlook is felt, therefore, to be distorted and understated by viewing the community in the context of the sub-region as a whole.

9.3.2.5 Employment multiplier. The use of a constant basic to non-basic employment multiplier in the report has been questioned. It is argued that in view of the provincial government's decentralization policy, and the fact that the service sector and other non-basic sectors become more important as a region develops, the multiplier should be increased over time. In other words, the sub-region's economy will not be tied so closely to the growth of the basic industries and new "basic" jobs will be matched by an increasing number of jobs in the non-basic sector. The use of a higher multiplier would, of course, increase the projected population of the sub-region.

9.2.3.6 Population multiplier. The economic growth study assumes a decreasing population multiplier based on the assumption of increasing labour force participation rates and changes in the age structure of the population. This means that a higher percentage of the population is expected to be in the work force in the future. Concern has been expressed by certain committee members that the study has overestimated the potential reduction in the population multiplier. They feel that higher unemployment rates may offset increased labour force participation rates and, hence, the rate of out-migration implicit in the population projections may be high. It has been argued that employment opportunities outside the East Peace sub-region may not be sufficiently attractive to increase the rate of out-migration, since the participation rate in the rest of Alberta will also be increasing. To the extent that

the study team has assumed too low a population multiplier, the sub-regional population projections are understated.

9.3.3 Future Action

The purpose of the report is to provide an initial planning tool for the East Peace sub-region. It is recognized by the steering committee that the study should be monitored on a regular basis and updated as new information becomes available. Consequently, the committee approved a motion that the report be reviewed by the Peace River Regional Planning Commission in twelve to eighteen months time and an addendum be prepared which would reflect more current economic and demographic data. By that time, 1981 federal census material will begin to be made publicly available and a clearer picture of regional resource prospects may emerge.

The steering committee also expressed concern regarding the relatively low rate of economic development anticipated for the sub-region. As a result, a motion calling for an economic strategies and policy review has been approved by the committee. The objective of this work would be to formulate an appropriate short- and long-term response to the economic needs of the study area.

9.4 SOURCES OF INFORMATION

This section lists the sources of information used in the preparation of this report. The first part documents the reports, books and other publications referred to, while the second part records the personal contacts made during the course of the study.

9.4.1 Bibliography

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9.4.2 Contacts and Interviews

9.4.2.1 Municipal Representative Survey

INDIVIDUAL	JURISDICTION
Denis Maisonneuve	Donnelly
George Halderson	East Prairie Metis Settlement
Gerard Maisonneuve	Falher
Paulette Briand	Falher
Lucien Turcotte	M.D. 130
Andre Gagnon	Girouxville
Bryce Walt	High Prairie

Len Kruger	I.D. 17
Ray Hassenstein	High Prairie
Laurent Lamoureux	McLennan
Roger Swetnam	Smoky River Regional Economic Development Board
Mrs. Alshewski	I.D. 16
Chuck Curr	I.D. 22, I.D. 17

9.4.2.2 Government Representatives Surveyed

REPRESENTATIVE	DEPARTMENT	LOCATION
Hector Goudreau	Alberta Agriculture	Falher
Steve Pauch	Alberta Energy and Natural Resources	Grande Prairie
Don Baker	Alberta Energy and Natural Resources	High Prairie
Stu Hehr	Alberta Fish and Wildlife	High Prairie
Glen Kirschman	Alberta Agriculture	Valleyview
Harry Looner	Alberta Energy and Natural Resources	Valleyview

9.4.2.3 Local Businesses Surveyed

BUSINESS	LOCATION
Debolt General Store	Debolt
Wild Rose General Store	Donnelly
Donnelly Hotel	Donnelly
Regis Butcher Shop and Confectionary	Donnelly

East Peace Gas Co-Op	Donnelly
Lake Rogers Sawmill	Donnelly
Little Buffalo Enterprises	Donnelly
Northern Alberta Agri-Business	Falher
MacLeod's	Falher
Peace River Honey Producers' Co-Op	Falher
Nelson Lumber	Gift Lake
Buchanan Lumber	High Prairie
Wagner Lumber	High Prairie
Bissell Lumber	High Prairie
Service Station and Store	Little Smoky
Faulkner Electric Ltd.	McLennan
Hollandia Bakery	McLennan
Danbrook & Pelland Plumbing & Heating	McLennan
Girouxville General Co-Op	Girouxville

9.4.2.4 Oil and Gas Telephone Survey

FIRM	LOCATION
Alberta Gas Trunk Line	Valleyview
Knight Measurement Control	Valleyview
Widney Well Servicing	Valleyview
Dragon Steaming & Painting	Valleyview
Gibson Petroleum	Valleyview
J & L Oil Sales Ltd.	Valleyview
Golden Peace Driling	Valleyview

Peace Pipe Line Ltd.	Valleyview
Be-Tee-Be Oilfield Servicing	Valleyview
Hudson Bay Oil & Gas	Valleyview
Shell Oil Simonette Gas Plant	Valleyview
Amerado	Valleyview
Gulf Canada	Valleyview

9.4.2.5 Interviews

INDIVIDUAL	POSITION/DEPARTMENT
Jim Lloyd	Commerical Fisheries Coordinator Fisheries & Wildlife Energy & Natural Resources
Leon Marciuk	Lands Division Energy & Natural Resources Edmonton
C.J. "Chuck" Curr	I.D. 17 and 22 Administrator Municipal Affairs
Peter de Voss	Municipal Affairs
Frank Hanus	Resource Economist Alberta Agriculture Edmonton
Art Peter	Peace River Forest Regional Supervisor
Ron Blackburn	Northern Development Branch Tourism & Small Business
D.J. Szarko	Manager, Transportation Systems Planning Alberta Transportation
Vance MacNichol	Regional Director Alberta Transportation Peace River

9.4.2.6 Institutions Contacted

INSTITUTION	INDIVIDUAL	LOCATION
Fairview Regional College	Dr. Fred Speckeen President	Fairview
Keyano College	Jerry Wills	Assumption
AVC Grouard	Fred Dumont Supervisor	Grouard
Grande Prairie Regional College	Dr. Henry Anderson President	Grande Prairie

9.4.2.7 Other Contacts

INDIVIDUAL	DEPARTMENT/COMPANY
F. Bishop	Regional Fisheries Biologist Energy & Natural Resources
Dave Luff	Resources & Planning Energy & Natural Resources
Roger Topping	Alberta Agriculture
Ron Fytch	Alberta Forest Service
Arlyn Todd	Fur Biologist Energy & Natural Resources
Grant Campbell	Director of Programme Support Energy & Natural Resources
W.R. Dempster	Alberta Forest Service
Brian Karaim	Forect Products Advisor Alberta Forest Service
Dr. Terry Church	Head, Preventative Medicine Branch Alberta Agriculture

Pam Colistro	Statistician Energy & Natural Resources
Ted Treller	Tourism & Small Business
Bob Gillies	Energy & Natural Resources
Ernie Stenton	Energy & Natural Resources
Mr. Slater	Freshwater Fish Co-Op
Guy L'Heureu	President Northwest Fish Co-Op Faust
Richard Cadrone	West End Fish Packers
Donna Auard	Legislative Clerk
Cecil Wright	Energy & Natural Resources
Tony Cashman	Government Services
Bill Harrington	Regional Council Lesser Slave Lake
J.R. Prokopchuk	Resources Inventory Section Energy & Natural Resources
Ken Morrison	Park Planner Grande Prairie District Alberta Recreation & Parks
Karen Thirwel	Energy & Natural Resources
Don Brownridge	Alberta Transportation
Al Lyon	Operations Manager Northern Division Co-Op Housing Branch Housing & Public Works
Horace Ottley	ADM Field Services Advanced Education & Manpower Edmonton
Lionel Remillard	Town of Falher
Merv Kurtz	East Smoky Public School District Valleyview

Rene Anctil	High Prairie Public School District
Ray Lamareux	McLennan Separate School District and Valleyview Separate School District
Eugene Miller	Separate Schools Town of High Prairie
Dr. Dave Young	Education North High Prairie
Dr. S.N. Odynak	Alberta Education
Steve Pawluk	Director of Program Development and Continuing Education Fairview Regional College
Al Cunningham	Employment & Immigration
Don Weaver	Superintendent Northlands School District Peace River